Check List 9(6): 1449–1470, 2013
© 2013 Check List and Authors
ISSN 1809-127X (available at *www.checklist.org.br*)

Check List
Journal of species lists and distribution

LISTS OF SPECIES

Checklist of Crustacea parasitizing fishes from Brazil

José L. Luque [1*], Fabiano M. Vieira [1], Ricardo M. Takemoto [2], Gilberto C. Pavanelli [2] and Jorge C. Eiras [3]

1 Universidade Federal Rural do Rio de Janeiro, Departamento de Parasitologia Animal, Caixa Postal 74540. CEP 23851-970. Seropédica, RJ, Brasil.
2 Universidade Estadual de Maringá, Laboratório de Ictioparasitologia, Núcleo de Pesquisas em Limnologia Ictiologia e Aquicultura – NUPÉLIA, Av. Colombo 5790. CEP 87020-900. Maringá, PR, Brasil.
3 Universidade do Porto, Faculdade de Ciências, Departamento de Biologia, and CIIMAR, Rua do Campo Alegre, s/n, Edifício FC4. 4169-007, Porto, Portugal.
* Corresponding author: E-mail: *luqueufrrj@gmail.com*

ABSTRACT: Here we provide a checklist of the crustacean species parasitizing both marine and freshwater fishes from Brazil. We list a total of 134 species of parasitic crustaceans associated with 205 species of fishes in Brazil. The data from this study added to the checklist of Copepoda in Brazilian fishes published in 2007 give a total of 251 species of parasitic crustaceans associated with 279 fish species currently known in Brazil. The majority of species of Crustacea listed as parasites of Brazilian fishes are Copepoda with 186 species registered. A total of 741 parasite-host associations were observed. Copepoda was the group with more host-parasite associations, totaling 419 associations. When comparing these data with those recorded for the fishes from other parasite hotspots of Neotropics (Mexico and Caribbean), it is possible to affirm that the fauna of parasitic crustaceans of Brazilian fishes is the richest in the region.

INTRODUCTION

The crustaceans (Arthropoda) are perhaps the invertebrate group with the highest morphological diversity (Martin and Davis 2001). It is estimated that there are approximately 67,000 species of crustaceans, which have a wide variety of habitats and habits (Martin and Davis 2001; Ahyong *et al.* 2011). Poulin and Morand (2004) estimated that there are around 5,400 described species of parasitic crustaceans.

In Brazil, the earlier reports of crustaceans associated with fishes date back to the nineteenth century in the studies of Burmeister (1835), Dana (1852), Krøyer (1863), and Heller (1865). Since then, records were fragmentary. The following studies should be mentioned: Rego (1983-1984), with records of larval Pentastomida from the Neotropical region, Boxshall and Montú (1997) on parasitic copepods on marine and brackish water fishes, Brasil-Lima (1998), Brasil-Lima and Barros (1998), and Pires-Vanin (1998), who listed the species of Malacostraca including parasitic species, Ho (1998a, b), who listed the Brazilian species of parasitic copepods from fishes, and Malta (1998), who listed the Maxillopoda including parasite species.

Another important contribution to the knowledge of the diversity of parasitic Crustacea in Brazil is a study of Thatcher (2006), in which he listed parasitic species from Amazonian fishes. Luque and Tavares (2007) compiled published data on copepods associated as parasites with fishes in Brazil; most recently, Eiras *et al.* (2010) published a list of parasites of freshwater fishes from Brazil which also included parasitic crustaceans, but these authors do not specify the sites of infestation and the localities. Here we provide a checklist of the crustaceans parasitic in both marine and freshwater fishes from Brazil, including detailed information on locality, habitat, and site of infection. The information is presented as parasite-host and host-parasite lists, with a key to the genera of parasitic crustaceans of fishes from Brazil.

MATERIALS AND METHODS

The list of parasitic crustaceans of fishes in Brazil was based on extensive search of published records. This bibliographic review of the crustacean species reported from fishes in Brazilian waters was complemented with information from the *Zoological Record*, *Biological Abstracts*, *Web of Knowledge*, *Google Scholar*, *Aquatic Sciences and Fisheries Abstracts*, *Biological and Agricultural Index Plus* and the Scopus. Data were compiled until March, 2013. In the case of parasitic copepods, only information not presented in the checklist of Copepoda parasites of fishes from Brazil by Luque and Tavares (2007) was included. The number of parasitic associations was calculated from the sum of the richness of species of parasites on each host species.

The checklist follows the classification and systematic arrangement proposed by Boxshall and Halsey (2004) for Copepoda, and Young (1998) and Martin and Davis (2001) for other crustacean groups.

The species of crustaceans are arranged according to taxonomic categories, within which the species are presented in alphabetical order, followed by hosts (specific name), site of infection, habitat, localities and references (between parentheses, in chronological order). In addition, the checklist also includes crustacean species identified only at the genus level and undetermined species. Crustacean names presented in the checklist follow the most recent taxonomic literature, but validity of individual taxa or reliability of their records was not critically examined by the present authors. Host species were arranged in taxonomic and then alphabetical order.

The key to identification of the genera of parasitic crustaceans from fishes in Brazil has been produced on the basis of those by Delaney (1989), Thatcher (2006), Poore and Bruce (2012) for Isopoda; Brusca (1981), Bruce (1986), Bruce and Bowman (1989), Thatcher (2006) for Cymothoidae; Thatcher (2006) for Argulidae; Boxshall and Montú (1997), Boxshall and Halsey (2004) for Copepoda;

and Rego (1983–1984), Rego and Eiras (1989), Junker *et al.* (1998) for larval Pentastomida. The fish species names were updated according to Froese and Pauly (2013).

Results

In the current study we list a total of 134 species of parasitic crustaceans associated with 205 species of fishes in Brazil including 10 species of copepods that were not listed by Luque and Tavares (2007). Thirty seven undetermined crustacean species were also included. In total, 251 determined species of crustaceans parasitizing 279 fish species are currently known from Brazil, according to Luque and Tavares (2007) and the data of the current study.

The majority of crustaceans listed are Copepoda with 186 species registered, which represent 74% of the total number. Isopoda are represented by 40 species (16%), Branchiura by 23 species (9.2%), and Pentastomida by two species (0.8%). The host species with more records of parasitic crustaceans in Brazil is *Hoplias malabaricus* (Bloch) (Characiformes, Erythrinidae), with 18 species, including the Copepoda listed by Luque and Tavares (2007).

We observed a total of 747 host-parasite associations in 279 host species. Copepoda was the group with more parasitic associations, totaling 419 associations, in Branchiura we observed 157 host-parasite associations, in Isopoda we observed 123 host-parasite associations, and Pentastomida has the record of 48 host-parasite associations.

In freshwater hosts a total of 133 determined and undetermined species of parasitic crustaceans are reported (Table 1). Copepoda is the group with the highest number of species, totaling 72 species, of which 96% are of the order Cyclopoida. In marine fishes 152 species of parasitic crustaceans are reported with no pentastomids recorded in marine hosts. In hosts of this habitat, Copepoda is also the group with the highest number of species, with 124 species, of which 68% belong to the order Siphonostomatoida. In brackish water fish a total of 11 species of parasitic crustaceans are reported, all of them are copepods.

The order of fishes which has the highest number of determined and undetermined species of parasitic crustaceans is Perciformes, with a total of 118 species (Table 2). In freshwater fishes, Characiformes is the order with the largest number of the species: 91. Its counterpart in marine fishes is the order Perciformes, with 89 species.

Keys to identification of genera of parasitic Crustacea found in fishes from Brazil

Key to families and genera of parasitic Isopoda of fishes from Brazil

1. Larvae parasitic on fish (praniza larvae), free living adults ..... **Family Gnathiidae,** *Gnathia*
- Adults parasitic on fishes ..... (2)
2. Pereopods 4–7 ambulatory; antenna with clear distinction between peduncle and flagellum; maxillipedal palp 2–5-articulate ..... (3)
- Pereopods 4–7 prehensile; antenna not as above, reduced, without clear distinction between peduncle and flagellum; maxillipedal palp 2-articulate ..... **Family Cymothoidae** (4)
3. Maxilliped and maxilla with stout, recurved apical spines; maxillule lateral lobe with slender stylet ..... **Family Aegidae,** *Rocinela*
- Maxilliped and maxilla without stout, recurved apical spines; maxillule lateral lobe without slender stylet ..... **Family Corallanidae,** *Excorallana*
4. Coxal plates on pereonite 1 free ..... *Anphira*
- Coxal plates on pereonite 1 fused ..... (5)
5. Legs 1-6 prehensile, ending in claw-like dactyls; leg 7 ambulatory ..... (6)
- All 7 pairs of legs prehensile, ending in claw-like dactyls ..... (7)
6. Pleon segmented and separated from pleotelson ..... *Artystone*
- Pleon and pleotelson fused into a single unit ..... *Riggia*
7. Pereonite 1 with anterior margin trisinuate ..... *Nerocila*
- Pereonite 1 without anterior margin trisinuate ..... (8)
8. Anterior margin of cephalon provided with 3 rounded bosses ..... *Asotana*
- Anterior margin of cephalon without rounded bosses ..... (9)
9. Some pleopods trilaminate ..... (10)
- All pleopods bilaminate ..... (11)
10. Pleopods 2–4 composed of 3–4 lamina ..... *Braga*
- Pleopods 2–5 composed of 3 lamina ..... *Cymothoa*
11. Cephalon slightly or deeply immersed in pereonite 1 ..... (12)
- Cephalon not immersed in pereonite 1 ..... (15)
12. Pleotelson wider than pleonite 1 ..... (13)
- Pleotelson narrower than pleonite 1 ..... (14)
13. Cephalon subtriangular ..... *Anilochra*
- Cephalon not subtriangular ..... *Paracymothoa*
14. Posterior margin of cephalon never sinuate; antennule larger than antenna; pleon deeply immersed in pereonite 7 ..... *Mothocya*
- Posterior margin of cephalon sinuate straight or sinuate; antennules shorter than antenna; pleon usually largely free of pereonite 7 ..... *Lironeca*
15. Antennae well separated at bases ..... (16)
- Antennae with bases in contact ..... *Glossobius*
16. Pleotelson narrower than pleonite 1 ..... *Vanamea*
- Pleotelson about as wide as pleonite 1 ..... *Telotha*

Key to genera of Branchiura (Argulidae) parasitic on fishes from Brazil

1. First maxillae sucker-like ..... (2)
- First maxillae simple, armed with claws ..... *Dolops*
2. Basal plates of second maxillae without teeth ..... *Dipteropeltis*
- Basal plates of second maxillae armed with teeth ..... *Argulus*

Key to orders, families and genera of parasitic Copepoda of fishes from Brazil

1. Oral cone present, formed from upper (labrum) and lower lips (labium) and containing stylet-like mandible; mandible rod-shaped and typically with teeth on one margin near apex ..... **Order Siphonostamotoida** (2)
- Oral cone absent; mouth covered anteroventrally by flattened labrum; paragnath separate; mandible typically falcate or tapering with 1 to 3 distinct distal blades and without palp ..... **Order Cyclopoida** (38)
2. Body dorsoventrally flattened; cephalothorax typically covered by subcircular dorsal cephalothoracic shield; lateral margins of shield typically ornamented with strips of membrane; antennules typically two-segmented ..... (3)
- Body not markedly dorsoventrally flattened, often highly transformed; cephalothorax not as above; antennules typically with at least 3 segments, or segmentation poorly expressed ..... (4)
3. Second and third pedigerous somites incorporated into cephalothorax; third legs fused with broad intercoxal sclerite to form apron which closes posterior border of cephalothoracic sucker; leg 4 usually uniramous, rarely biramous ..... **Family Caligidae** (11)
- Third or second and third pedigerous somites free, not incorporated into cephalothorax; leg 3 not forming apron; leg 4 biramous ..... **Family Pandaridae** (19)
4. Adult female transformed, mesoparasitic, with anterior end forming cephalothoracic holdfast typically embedded in host tissues ..... **Family Pennellidae** (metamorphosed) (23)
- Adult female body cylindrical and segmented, or lacking external segmentation, or highly transformed; typically attached to surface of host by means of appendages ..... (5)
5. Attachment to host by means of modified maxillae, typically maxillae forming fleshy "arms" often fused at tip, with or without small chitinous anchor, sometimes ribbon-like and encircling gill filaments of host, rarely branching at tip and inserted into host ..... **Family Lernaeopodidae** (27)
- Attachment usually by means of powerful, claw-like antennae ..... (6)
6. Maxillipeds absent in female ..... (7)
- Maxillipeds present in female ..... (8)
7. Cephalothorax usually elongate; free pedigerous somites distinct; tip of maxilla simple; swimming legs well developed, with large protopodal segments and distinct intercoxal sclerite, legs 1 and 2 biramous, legs 3 biramous or uniramous, leg 4 uniramous or absent ..... **Family Pennellidae** (pre-metamorphosis) (23)
- Cephalothorax short; pedigerous somites not distinct, incorporated into unsegmented trunk; tip of maxilla bifid; legs typically lacking intercoxal sclerites; legs 3 and 4 often reduced, sometimes absent ..... **Family Hatschekiidae,** *Hatschekia*
8. Leg 3 flattened, plate-like ..... (9)
- Leg 3 biramous or lobate, not plate-like ..... (10)
9. Body of adult female either cylindrical with somites weakly defined, or with pedigerous somites clearly defined and second pedigerous somite bearing pair of dorsal elytra; leg 4 absent ..... **Family Dichelesthiidae** (36)
- Body of adult female comprising head and trunk, lacking traces of external segmentation; leg 4 biramous and lobate or flattened. **Family Lernanthropidae** (72)
10. Body comprising dorsoventrally-flattened, caligiform cephalothorax usually with paired, posteriorly-directed cephalic stylets, 3 free pedigerous somites, genital complex and 1 to 3-segmented abdomen ..... **Family Kroyeriidae,** *Kroyeria*
- Cephalothorax not caligiform; body not as above ..... **Family Pseudocycnidae** (37)
11. Leg 1 with distinctly 2-segmented endopod ..... (12)
- Leg 1 with endopod reduced to vestigial lobe ..... (14)
12. Leg 4 biramous ..... *Euryphorus*
- Leg 4 rudimentary or uniramous ..... (13)
13. Leg 4 rudimentary; sternal furca absent ..... *Alebion*
- Leg 4 uniramous, 4-segmented; sternal furca present ..... *Gloipotes*
14. Lunules present on frontal plates ..... (15)
- Lunules absent; frontal plates present or absent .... (18)
15. Genital complex with distinct posterolateral processes overlapping proximal part of abdomen ..... *Caligodes*
- Genital complex without distinct posterolateral processes ..... (16)
16. Dorsal plates present on free fourth pedigerous somite ..... *Tuxophorus*
- Free fourth pedigerous somite lacking dorsal plates ..... (17)
17. Sternal furca absent; all spines on apex of leg 1, exopod simple ..... *Metacaligus*
- Sternal furca present; middle 2 spines on apex of leg 1, exopod typically bifid ..... *Caligus*
18. Leg 3 with 2-segmented exopod; leg 3 lacking inner seta on first endopodal segment ..... *Anuretes*
- Leg 3 usually with 3-segmented exopod; leg 3 with inner seta on first endopodal segment ..... *Lepeophtheirus*
19. Dorsal plates present on second to fourth pedigerous somites; apex of maxilla bearing spinous process (clavus) in addition to calamus and canna ..... (20)
- Dorsal plates, if present, on fourth pedigerous somite only; apex of maxilla bearing patch of spinules or setules (crista) in addition to calamus and canna ... (21)
20. Abdomen and caudal rami hidden dorsally .... *Perissopus*
- Abdomen and caudal rami visible dorsally .... *Pandarus*
21. Abdomen two-segmented ..... *Dinemoura*
- Abdomen one-segmented ..... (22)
22. Leg 4 plate-like ..... *Echthrogaleus*
- Leg 4 not plate-like ..... *Nessipus*
23. Brush-like processes present on abdomen ..... *Pennella*
- Abdomen without processes ..... (24)
24. Trunk sigmoid ..... (25)
- Trunk not sigmoid ..... (26)
25. Eggs sacs coiled loosely around axial rod ..... *Lernaeocera*
- Eggs sacs spirally coiled ..... *Trifur*
26. Neck formed by first to third pedigerous somites at most; fourth pedigerous somite forming part of trunk; body cylindrical, neck in line with trunk; egg sacs linear ..... *Metapeniculus*

- Neck formed by pedigerous somites 1 to 4 and incorporating part of region posterior to leg 4; body cylindrical or ovoid, neck in line with trunk or set at angle; egg sacks coiled or linear ..... *Lernaeenicus*

27. Male divided into anterior cephalothorax and posterior trunk ..... (28)
- Male with trunk extremely reduced, typically represented by sac-like process ..... (32)

28. Branched processes present on trunk and typically on maxillae ..... *Thysanote*
- Branched processes absent ..... (29)

29. Distinct unsegmented abdominal region present posterior to oviduct ..... *Clavellistes*
- Abdominal region not distinct ..... (30)

30. Cephalothorax short, dorsoventrally flattened ..... *Lernaeopoda*
- Cephalothorax cylindrical, elongate ..... (31)

31. Maxillule with 3 terminal papillae on inner lobe ..... *Brachiella*
- Maxillule with 2 terminal papillae, third reduced to seta or absent ..... *Parabrachiella*

32. Female maxillae ribbon-like, forming loop-like attachment device; bulba absent ..... *Naobranchia*
- Female maxillae cylindrical, with bulla at tip ..... (33)

33. Female cephalothorax short, anteriorly directed; male caudal ramus cylindrical ..... *Charopinopsis*
- Female cephalothorax elongate, cylindrical; male caudal rami weakly developed, often absent ..... (34)

34. Cephalothorax arising from centre of dorsal surface of trunk ..... *Clavellisa*
- Cephalothorax arising from anterior end of trun..... (35)

35. Posterior processes, in addition to vestigial caudal rami, present on trunk; maxillae incorporated into trunk ..... *Clavellopsis*
- Posterior processes absent from trunk; maxillae distinct from trunk ..... *Clavellotis*

36. Antennule at least 21-segmented in female; leg 4 present (fossil) ..... *Kabatarina*
- Antennule 6-segmented; leg 4 absent ..... *Anthosoma*

37. Male leg 4 forming a prominent, laterally-directed process with apical seta; female caudal rami about half length of genital complex ..... *Pseudocycnus*
- Male leg 4 reduced to a seta on surface of somite; female caudal rami less than one third length of genital complex ..... *Cybicola*

38. Mandible small with tapering terminal blade; adult female with copulatory pore located midventrally on genital double-somite, genital apertures paired and typically located dorsolaterally ..... **Family Lernaeidae** (45)
- Mandible falcate or tapering with 1 to 3 distinct distal blades; adult female with copulatory pores not separate, situated within dorsolaterally located paired genital apertures ..... (39)

39. Body typically cyclopiform, rarely modified; mandible usually with 3, rarely with 2 spinulate blades; maxillipeds lacking in female; leg 4 with at most two-segmented exopod, sometimes one-segmented, rarely absent ..... **Family Ergasilidae** (50)
- Body cyclopiform or transformed, sometimes highly modified; mandible of different form; maxillipeds usually present in female,; leg 4 with up to three-segmented exopod, or reduced, or absent ..... (40)

40. Mandible forming a tapering lobe typically bearing 2 distinct blades at the tip, rarely with 1 or 3 distal blades; distal part of antennae flexed, claws derived from second and third endopodal segments; body typically with well defined external segmentation, rarely modified ..... (41)
- Mandible a curved, falcate blade, armed with teeth, sometimes with accessory toothed seta or forming a tapering lanceolate process; antennae often subchelate with strong distal claw or otherwise modified; body cyclopiform or modified without clear segmentation ..... (42)

41. Maxillipeds located posterior to mouth ..... **Family Taeniacanthidae** (61)
- Maxillipeds located lateral to mouth ..... **Family Bomolochidae** (63)

42. Body of adult female without external segmentation; adult males dwarf, with vestigial lobate swimming legs ..... **Family Chondracanthidae** (68)
- Body of adult female often modified by fusion of anterior somites but typically retaining well defined urosomal somites; adult males with well defined segmentation; and with at least legs 1 and 2 biramous with segmented rami ..... (43)

43. Body of adult female elongate, flattened or often highly irregular with numerous processes; antennae of female modified, no subchelate; with at least 2 claws in male; endoparasites inhabiting mucous ducts of host or pouches in body wall or viscera ..... **Family Philichthyidae**, *Colobomatus*
- Body of adult female cylindrical, without processes; antennae forming strong subchela oriented either transversely or antero-posteriorly; ectoparasites inhabiting gills and nasal lamellae ..... **Family Shiinoidae**, *Shiinoa*

44. Body longer than 8 mm ..... (45)
- Body smaller than 6 mm ..... *Minilernaea*

45. Head forming well developed holdfast with antler-like processes, lobes or dendritic processes ..... (46)
- Head not forming holdfast ..... *Lamproglena*

46. Elongate neck region at, or posterior to legs 4, separating holdfast from swollen trunk region,; post-genital abdominal part typically as long as anterior part of trunk ..... (47)
- Neck region not usually defined by marked increase in width of trunk; post-genital abdomen typically short ..... *Lernaea*

47. Holdfast composed by pair of large, rounded lateral processes ..... (48)
- Holdfast comprising 2 pairs of equal lateral processes and a pair of small frontal lobes ..... *Amazolernaea*

48. Trunk with collar-like processes anteriorly, at level of leg 4 ..... *Bedsylernaea*
- Trunk with smoothly graded anterior margin ..... *Perulernaea*

49. Body with reduction in the number of somites ..... (50)
- Body without reduction in the number of somites . (51)

50. Genital double-somite remains separate from pedigerous somite ..... *Therodamas*
- Genital double-somite incorporated into the fourth and fifth pedigerous omites ..... *Urogasilus*

51. Large, posteriorly-directed stylets (retrostylets) present at posterolateral of dorsal cephalic shield .... *Rhinergasilus*
- Rear margin of cephalic shield without such stylets .... (52)
52. Antenna with extremely elongate second segment (first endopodal segment) and short claw that locks into groove in third segment of other member of pair . (53)
- Antennae not interlocking in this manner ..... (55)
53. Endopod of leg 1 two-segmented ..... (54)
- Endopod of leg 1 one-segmented ..... *Miracetyma*
54. Endopod of leg 1 armed with at least 6 elements .... *Acusicola*
- Endopod of leg 1 unarmed ..... *Amplexibranchius*
55. Leg 4 absent ..... *Brasergasilus*
- Leg 4 present ..... (56)
56. Leg 4 reduced to lobe bearing single seta ..... (59)
- Leg 4 biramous ..... (57)
57. Second segment (first endopodal segment) of antenna robust with 1 or 2 prominent teeth of medial margins ..... *Prehendorastrus*
- Second antennary segment without such teeth ..... (58)
58. Antennary claw barbed, with single tooth near tip of claw ..... *Gauchergasilus*
- Antennary claw without distal barb ..... *Ergasilus*
59. Antenna with single terminal claw ..... *Vaigamus*
- Antenna with 2 terminal claws ..... (60)
60. Antennule 6-segmented in female; second segment of antenna with 1 inner spine ..... *Gamidactylus*
- Antennule 5-segmented in female; segment with inner spine and large patch of spinules ..... *Gamispatulus*
61. Female body comprising head, bearing expanded lateral lobes and subrectangular trunk ..... *Tucca*
- Female body with at least second to fourth pedigerous somites free and well defined 62
62. Rostral area with corrugated shield-like plate on ventromedian surface ..... *Taeniastrotos*
- Rostral area without corrugated shield-like plate on ventromedian surface ..... *Taeniacanthus*
63. One or more of 5 setae on proximal segment of antennule modified ..... (64)
- All 5 setae on this segment plumose, unmodifie ..... (66)
64. One seta on proximal segment of antennule modified; caudal rami with 2 major setae ..... (65)
- Two or more setae on proximal segment of antennule segment modified; caudal rami with 1 major setae .... *Nothobomolochus*
65. Fourth seta on proximal segment of antennules modified to form hook; other setae on this segment plumose but reinforced by strips of thickened cuticle ..... *Bomolochus*
- Fourth seta modified to form heavy spine, other setae on segment not reinforced ..... *Unicolax*
66. Caudal rami with 2 major setae ..... *Ceratocolax*
- Caudal rami with 1 major seta ..... (67)
67. Exopodal segment 2 of legs 2 to 4 without inner seta ..... *Orbitocolax*
- Exopodal segment 2 of legs 2 to 4 with 1 inner seta .... *Acantholochus*
68. Trunk region with lateral outgrowths in form of processes, protusions or knobs ..... *Chondracanthus*
- Trunk region without lateral outgrowths ..... (69)
69. Trunk with pair of posterolateral processes .... *Acanthochondria*
- Trunk without posterolateral processes ..... (70)
70. Terminal segment of antenna not uncinate ..... *Blias*
- Terminal segment of antenna uncinate ..... (71)
71. Head spherical ..... *Brasilochondria*
- Head subspherical ..... *Argentinochondria*
72. Members of leg 3 pair fused with dorsal plates of fourth pedigerous somite to form lateral plates .... *Lernanthropinus*
- Members of leg 3 pair not fused ..... *Lernanthropus*

Key to families and genera of larval Pentastomida parasitic in fishes from Brazil

1. Body vermiform; anterior and posterior hooks with two blades ..... **Family Sebekiidae** (2)
- Body elliptical; anterior and posterior hooks simple, with one blade .. **Family Subtriquetridae,** *Subtriqueta*
2. Body with more than 90 annulations; hooks larger than 200 µm ..... *Leiperia*
- Body with less than 90 annulations; hooks smaller than 150 µm ..... *Sebekia*

Parasite host list

Subphylum Crustacea Brünnich, 1772
Class Malacostraca Latreille, 1802
Subclass Eumalacostraca Grobben, 1892
Order Isopoda Latreille, 1817
Family Aegidae White, 1850

Rocinela signata Schiodte and Meinert, 1879

Mullus argentinae, *Scomberomorus brasiliensis*, *Sparisoma frondosum*; mouth, gill chamber; marine; Ceará, Maranhão, Pernambuco, Rio de Janeiro, Rio Grande do Norte, São Paulo (Moreira 1972; Brasil-Lima 1986; 1998, Luque *et al.* 2002; Lima *et al.* 2005; Cavalcanti *et al.* 2012).

Family Corallanidae Hansen, 1890

Excorallana sp.

Ageneiosus inermis; body surface; freshwater; Amazonas, Pará (Thatcher 2006).

Family Cymothoidae Leach, 1814

Anilocra haemuli Williams and Williams, 1981

Paranthias furcifer; mouth; marine; Rio de Janeiro (Thatcher 2000; 2002).

Anphira branchialis Thatcher, 1993

Pygocentrus nattereri, *Serrasalmus spilopleura*; gill chamber; freshwater; Amazonas, Goiás, Roraima (Thatcher 1993a; Brasil-Lima and Barros 1998; Carvalho *et al.* 2004; Eiras *et al.* 2010; Vital *et al.* 2011).

Anphira junki Araújo and Thatcher, 2003

Triportheus albus, T. angulatus; gill chamber; freshwater; Amazon (Araújo and Thatcher 2003; Eiras *et al.* 2010).

Anphira xinguensis Thatcher, 1995

Ossubtus xinguense; gill chamber; freshwater; Pará (Thatcher 1995; Eiras *et al.* 2010).

Artystone minima Thatcher and Carvalho, 1988
Nannostomus beckfordi; body cavity; freshwater; Amazonas (Thatcher and Carvalho 1988; Brasil-Lima and Barros 1998; Eiras *et al.* 2010).
Artystone trysibia Schiödte, 1866
Crenicichla lacustris, *C. saxatilis*, *Geophagus brasiliensis*; in pouches within the body cavity; freshwater; Roraima, Santa Catarina (Schiödte 1866; Lemos de Castro and Machado Filho 1946; Huizinga 1972; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998; Eiras *et al.* 2010).
Asotana magnifica Thatcher, 1988
Serrasalmus sp.; mouth; freshwater; Roraima (Thatcher 1988; Brasil-Lima and Barros 1998; Eiras *et al.* 2010).
Asotana sp.
Pygocentrus nattereri; mouth, freshwater; Goiás (Carvalho *et al.* 2004).
Braga amapaensis Thatcher, 1996
Acestrorhynchus microlepis; mouth; freshwater; Amapá (Thatcher 1996; Eiras *et al.* 2010).
Braga cichlae Schiödte and Meinert, 1881
Cichla ocellaris, *C. temensis*, *Galeocharax humeralis*; mouth; freshwater; Amazonas, Minas Gerais, Pará, São Paulo (Schiödte and Meinert 1881; Lemos de Castro 1959; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998; Thatcher 2006; Araújo *et al.* 2009; Eiras *et al.* 2010).
Braga cigarra (Szidat and Schubart, 1960)
Galeocharax humeralis, G. kneri; mouth; freshwater; Minas Gerais, São Paulo (Lemos de Castro 1959; Szidat and Shubart 1960; Taberner 1986; Brasil-Lima and Barros 1998; Thatcher *et al.* 2009; Eiras *et al.* 2010).
Braga fluviatilis Richardson, 1911
Cichla temensis, *Loricariichthys anus*; mouth; back of the fish; freshwater; Bahia, Minas Gerais, Pernambuco, Rio de Janeiro (Richardson 1911; Lemos de Castro 1959; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998).
Braga nasuta Schiödte and Meinert, 1881
Hypostomus sp.; mouth; freshwater; Amazonas, Bahia, São Paulo (Schiödte and Meinert 1881; Lemos de Castro 1959; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998; Thatcher 2006; Eiras *et al.* 2010).
Braga patagonica Schiödte and Meinert, 1884
Colossoma macropomum, *Hoplias malabaricus*, *Salminus hilarii*; mouth, body surface; freshwater; Amazonas, Bahia, Pará, Pernambuco, São Paulo (Lemos de Castro 1959; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998; Thatcher 2006; Eiras *et al.* 2010).
Braga sp.
Hoplias lacerdae, *Pygocentrus piraya*; mouth, gills; freshwater; São Francisco River (Brasil-Sato 2003).
Cymothoa brasiliensis Schiödte and Meinert, 1884
Caranx sp., '*Sargus* sp.'; mouth; marine; Rio de Janeiro (Thatcher *et al.* 2003b).
Cymothoa catarinensis Thatcher, Silva, Jost and Souza-Conceição, 2003
Menticirrhus littoralis; mouth; marine; Santa Catarina (Thatcher *et al.* 2003b).
Cymothoa excisa Perty, 1833
Micropogonias furnieri; mouth; marine; Santa Catarina (Thatcher *et al.* 2003b).
Cymothoa gerris Schiödte and Meinert, 1884
Eugerres brasilianus; mouth; marine; northeastern coast of Brazil (Thatcher *et al.* 2003b).
Cymothoa ianuarii Schiödte and Meinert, 1884
'*Platessa* sp.', *Priacanthus* sp.; mouth; marine; Rio de Janeiro (Thatcher *et al.* 2003b).
Cymothoa liannae Sartor and Pires, 1988
Chloroscombrus chrysurus; mouth; marine; Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, São Paulo (Sartor 1987; Sartor and Pires 1988; Pires-Vanin 1998; Thatcher *et al.* 2003b).
Cymothoa oestrum (Linnaeus, 1758)
Caranx latus, *Centropomus undecimalisi*, *Cephalopholis fulva*, *Oligoplites palometa*; mouth, gills; marine; Pernambuco, Santa Catarina (Thatcher 2000; 2002; Thatcher *et al.* 2003b).
Cymothoa recifea Thatcher and Fonseca, 2005
Centropomus undecimalis, *Cephalopholis fulva*, *Oligoplites palometa*; mouth; marine; Pernambuco (Thatcher and Fonseca 2005).
Cymothoa spinipalpa Thatcher, Araújo, Lima and Cellappa, 2007
Chloroscombrus chrysurus, *Mugil curema, Oligoplites saurus*; gill chamber, mouth, tongue; marine; Rio Grande do Norte (Thatcher *et al.* 2007; Costa *et al.* 2010; Cavalcanti *et al.* 2011).
Cymothoa sp. 1
Chloroscombrus chrysurus; gill chamber, mouth; marine; Paraná, Santa Catarina, São Paulo (Sartor 1986).
Cymothoa sp. 2
Genidens barbus; mouth; marine; Santa Catarina (Sartor 1986).
Glossobius impressus (Say, 1818)
Exocoetus sp.; mouth; marine; Rio de Janeiro (Thatcher 2000; 2002).
Lironeca desterroensis Thatcher, Souza-Conceição and Jost, 2003
Cetengraulis edentulus; gills; marine; Pará, Santa Catarina (Thatcher *et al.* 2003c; Monfort *et al.* 2009).
Lironeca redmanni Leach, 1818
Ctenosciaena gracilicirrhus, *Cynoscion jamaicensis*, *C. striatus*, *Micropogonias furnieri*, *Orthopristis ruber*, *Scomberomorus brasiliensis*, *Thyrsitops lepidopoides*, *Umbrina canosai*; gill chamber, mouth; marine; Rio de Janeiro, Rio Grande do Norte, Paraná, Santa Catarina (Sartor 1986; Pires-Vanin 1998; Lima *et al.* 2005).
Lironeca splendida Sadowsky and Moreira, 1981
Chloroscombrus chrysurus, *Squalus cubensis*; gill chamber, mouth; marine; Paraná, Rio Grande do Sul, Santa Catarina, São Paulo (Sadowsky and Moreira 1981; Pires-Vanin 1998; Costa and Chellappa 2010).
Lironeca sp. 1
Squalus cubensis; unspecified site of infestation; marine; Rio de Janeiro (Sartor 1986).
Lironeca sp. 2
Cetengraulis edentulus; unspecified site of infestation; marine; São Paulo (Sartor 1986).

Lironeca sp. 3

Eucinostomus argenteus; unspecified site of infestation; marine; Santa Catarina (Sartor 1986).

Mothocya bohlkeorum Williams and Williams, 1982

Odontesthes bonariensis; gill chamber; marine; Paraná (Thatcher 2000; 2002).

Mothocya nana (Schiodte and Meinert; 1884)

Unidentified host; gill chamber; Rio de Janeiro (Thatcher 2000; 2002).

Mothocya omidaptria Bruce, 1986

Hyporhampus unifasciatus; unspecified site of infestation; marine; unspecified locality (Bruce 1986).

Nerocila armata Dana, 1853

Cichla ocellaris, *Crenicichla saxatilis*, *Leporinus fasciatus*, *Mustelus canis, Micropogonias furnieri, Pogonias cromis*, *Pseudauchenipterus nodosus*; gill chamber, mouth; marine, freshwater; Rio de Janeiro, Rio Grande do Sul, São Paulo (Dana 1853; Moreira 1973; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998; Pires-Vanin 1998; Thatcher 2006; Eiras *et al.* 2010).

Paracymothoa astyanaxi Lemos de Castro, 1955

Astyanax bimaculatus; mouth; freshwater; Minas Gerais, Rio de Janeiro (Lemos de Castro 1955; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998; Eiras *et al.* 2010).

Riggia acuticaudata Thatcher, Lopes and Froehlich, 2002

Ancistrus sp.; pouches in body cavity; freshwater; Mato Grosso do Sul (Thatcher *et al.* 2002; Eiras *et al.* 2010).

Riggia brasiliensis Szidat and Schubart, 1960

Leporellus vittatus, Leporinus copelandii, L. octofasciatus, Schizodon nasutus; pouches in body cavity; freshwater; São Paulo (Szidat and Schubart 1960; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998; Eiras *et al.* 2010).

Riggia cryptocularis Thatcher, Lopes and Froelich, 2003

Ancistrus sp., *Odontostilbe* sp.; pouches in body cavity; freshwater; Mato Grosso do Sul (Thatcher *et al.* 2003a; Eiras *et al.* 2010).

Riggia nana Szidat and Schubart, 1960

Leporinus striatus; pouches in body cavity; São Paulo (Szidat and Schubart 1960; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998; Eiras *et al.* 2010).

Riggia paranensis Szidat, 1948

Curimata platana, *Cyphocharax gilbert*; pouches in body cavity; freshwater; Paraná, Rio de Janeiro (Szidat 1948; Bastos and Thatcher 1997; Azevedo *et al.* 2002; 2006; Lima *et al.* 2007; Eiras *et al.* 2010).

Telotha henselii (Von Martens, 1869)

Brachyplatystoma sp., *Geophagus brasiliensis, Geophagus* sp., *Gymnogeophagus gymnogenys, Hoplias malabaricus, Pimelodus maculatus, Synodontis clarias*; mouth; freshwater; Rio Grande do Sul (Von Martens 1869 Alberto *et al.* 2001; Thatcher 2006; Eiras *et al.* 2010).

Telotha lunaris Schiödte and Meinert, 1883

Apteronotus brasiliensis; mouth; freshwater; Minas Gerais (Schiödte and Meinert 1881; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998; Eiras *et al.* 2010).

Telotha silurii Szidat and Schubart, 1960

Iheringichthys labrosus; mouth; freshwater; São Paulo (Szidat and Schubart 1960; Lemos de Castro and Loyola e Silva 1985; Brasil-Lima and Barros 1998; Eiras *et al.* 2010).

Telotha sp.

Pimelodus maculatus; gills; freshwater; São Francisco River, Upper Paraná River (Brasil-Sato 2003; Takemoto *et al.* 2009; Eiras *et al.* 2010).

Vanamea symmetrica (Van Name, 1925)

Brachyplatystoma sp., *Carnegiella strigata*, *Cichla monoculus*, *Doras carinatus*, *Myleus rubripinnis*, *Serrasalmus rhombeus*, *S. spilopleura*, *Vandellia cirrhosa*; mouth; freshwater; Amazonas, Pará (Thatcher 1993b; Brasil-Lima and Barros 1998).

Cymothoid not identified

Balistes capriscus, *Centropomus undecimalis*, *Dactyloperus volitans*, *Euthynnus alletteratus*, *Micropogonias furnieri*, *Pagrus pagrus*, *Pellona harroweri*, *Pinguipes brasilianus, Urophycis brasiliensis*; body surface, gill chamber; marine; Rio de Janeiro, Santa Catarina (Sartor 1986; Alves and Luque 2001; 2006; Paraguassú *et al.* 2002; Tavares and Luque 2004; Alves *et al.* 2004; 2005; Timi *et al.* 2010).

'*Aegathoa* sp.'

Chloroscombrus chrysurus; unspecified site of infestation; marine; Paraná (Sartor 1986).

Family Gnathiidae Leach, 1814

Gnathia sp. (larva)

Anableps anableps, Aspistor luniscutis, Gymnothorax moringa, Percophis brasiliensis, Pinguipes brasilianus, Priacanthus arenatus, Prionoctus punctatus; gills; marine, brackish; Rio de Janeiro, Pará, São Paulo (Tavares *et al.* 2001; Bicudo *et al.* 2005; Luque *et al.* 2008).

Not identified Gnathiidae praniza larvae

Amphiarius phrygiatus, *Anableps anableps*, *Cetengraulis edentulus, Conodon nobilis, Mugil gaimardianus*, *Pinguipes brasilianus*; body surface; marine; Pará, Rio de Janeiro (Diniz *et al.* 2008; Timi *et al.* 2010).

Class Maxillopoda Dahl, 1956

Subclass Branchiura Thorell, 1864

Order Arguloida Yamaguti, 1963

Family Argulidae Leach, 1819

Argulus amazonicus Malta and Santos-Silva, 1986

Cichla monoculus, *C. ocellaris*, *C. temensis*, *Osteoglossum bicirrhosum*; gills; freshwater; Amazonas (Malta and Santos-Silva 1986; Malta 1998; Malta and Varella 2000; Eiras *et al.* 2010).

Argulus carteri Cunnington, 1931

Hoplias malabaricus; gills; freshwater; unspecified locality (Lemos de Castro 1985; Malta 1998; Eiras *et al.* 2010).

Argulus chicomendesi Malta and Varella, 2000

Arapaima gigas, *Brycon amazonicus*, *B. cephalus*, *Colossoma macropomum*, *Hypophthalmus edentatus*, *Prochilodus nigricans*, *Pseudoplatystoma tigrinum*, *Pygocentrus nattereri*, *Schizodon fasciatus*; gills; freshwater; Amazonas (Malta and Varella 2000; Eiras *et al.* 2010).

Argulus coregoni Thorel, 1864
Cyprinus carpio carpio; body surface; freshwater; Paraná (Bowen and Heckmann 2002).
Argulus elongatus Heller, 1857
Pygocentrus nattereri, Serrasalmus marginatus, S. spilopleura; gills; freshwater; Mato Grosso do Sul (Heller 1857; Moreira 1912; Ringuelet 1943; Malta 1998; Carvalho *et al.* 2003; Eiras *et al.* 2010).
Argulus juparanaensis Lemos de Castro, 1950
Astyanax bimaculatus, *Megalodoras* sp., *Pachyurus bonariensis*, *P. squamipennis*, *Potamotrygon motoro*, *Pseudoplatystoma fasciatum*, *Pygocentrus nattereri*, *Serrasalmus marginatus*, *S. spiloleura*; gills; freshwater; Amazonas, Espírito Santo, Mato Grosso do Sul, Pará (Lemos de Castro 1950; Yamaguti 1963; Malta 1982a; 1998; Lemos de Castro 1985; Peralta *et al.* 1998; Malta and Varella 2000; Carvalho *et al.* 2003; Eiras *et al.* 2010).
Argulus multicolor Stekhoven, 1937
Cichla temensis, *Colossoma macropomum*, *Oreochromis niloticus*, *Pygocentrus nattereri*, *Rhaphiodon vulpinus*, *Satanoperca jurupari*; gills; freshwater; Amazonas, Mato Grosso, Pará (Lemos de Castro 1949; 1985; Malta 1983; 1998; Malta and Varella 2000; Thatcher 2006; Eiras *et al.* 2010).
Argulus nattereri Heller, 1857
Pseudoplatystoma corruscans, *Pseudoplatystoma* sp., *Salminus brasiliensis*, *S. franciscanus*; body surface, gills; freshwater; Mato Grosso do Sul, Paraná, São Paulo (Moreira 1912; Lemos de Castro 1985; Malta 1998; Eiras *et al.* 2010).
Argulus paranaensis Ringuelet, 1943
Salminus brasiliensis; body surface, gills; freshwater; unspecified locality (Ringuelet 1943; Yamaguti 1963; Thatcher 2006; Eiras *et al.* 2010).
Argulus paulensis Wilson, 1924
Salminus brasiliensis, *S. hilarii*; body surface, gills; freshwater; São Paulo (Wilson 1924; Yamaguti 1963; Eiras *et al.* 2010).
Argulus pestifer Ringuelet, 1948
Pseudoplatystoma corruscans, *P. fasciatum*, *P. tigrinum*, *Salminus brasiliensis*; body surface; freshwater; Amazonas, Upper Paraná River (Malta 1983; 1998; Lemos de Castro 1985; Malta and Varella 2000; Thatcher 2006; Takemoto *et al.* 2009; Eiras *et al.* 2010).
Argulus salmini Krøyer, 1863
Salminus brasiliensis, *S. franciscanus*; body surface, gills; freshwater; Mato Grosso, Minas Gerais, São Paulo (Moreira 1912; Yamaguti 1963; Lemos de Castro 1985; Malta 1998; Thatcher 2006; Eiras *et al.* 2010).
Argulus spinulosus Silva, 1980
Hoplias malabaricus, *Oreochromis niloticus*; gills; freshwater; Rio Grande do Sul, Santa Catarina (Silva 1980; Lemos de Castro 1985; Malta 1998; Eiras *et al.* 2010).
Argulus sp.
Arapaima gigas, *Astronotus ocellatus*, *Brycon cephalus*, *Cichla ocellaris*, *C. temensis*, *Colossoma macropomum*, *Hypophthalmus edentatus*, *Leporinus elongatus*, *L. friderici*, *L. lacustris*, *L. macrocephalus*, *L. obtusidens*, *L. piau*, *L. reinhardti*, *Leporinus* sp., *Oreochromis niloticus*, *Phractocephalus hemioliopterus*, *Piaractus mesopotamicus*, *Potamorhina laticeps*, *P. latior*, *Prochilodus nigricans*, *Psectrogaster ciliata*, *Pseudoplatystoma fasciatum*, *Pygocentrus nattereri*, *Rhytiodus microlepis*, *Schizodon fasciatus*; body surface, gills, mouth; freshwater; Amazonas, Mato Grosso do Sul, Minas Gerais, Paraná, São Paulo, Upper Paraná River (Tavares-Dias *et al.* 2001; Guidelli *et al.* 2006; Campos *et al.* 2008; Takemoto *et al.* 2009; Eiras *et al.* 2010).
Argulus sp.
Dactylopterus volitans, *Prionoctus punctatus*, *Urophycis brasiliensis*; body surface, gills; marine; Rio de Janeiro (Alves *et al.* 2004; Bicudo *et al.* 2005; Cordeiro and Luque 2005).
Dipteropeltis hirundo Calman, 1912
Acestrorhynchus sp., *Astyanax fasciatus*, *Brycon melanopterus*, *Luciopimelodus pati*, *Mylossoma aureum*, *Salminus brasiliensis*, *S. franciscanus*, *Pygocentrus piraya*,; gills; freshwater; Amazonas, Mato Grosso, São Paulo (Moreira 1912; Melo-Leitão 1914; Carvalho 1941; Lemos de Castro 1985; Malta 1998; Eiras *et al.* 2010).
Dolops bidentata (Bouvier, 1899)
Astronotus ocellatus, *Piaractus brachypomus*, *Prochilodus nigricans*, *Pygocentrus nattereri*, *Raphiodon vulpinus*, *Rhytiodus microlepis*, *Schizodon fasciatus*, *Synbranchus marmoratus*; gills; body surface; freshwater; Amazonas, Mato Grosso (Lemos de Castro 1950; Yamaguti 1963; Malta 1982b; Thatcher 2006; Eiras *et al.* 2010; Silva-Souza *et al.* 2011).
Dolops carvalhoi Lemos de Castro, 1949
Arapaima gigas, *Colossoma macropomum*, *Pellona castelnaeana*, *Phractocephalus hemioliopterus*, *Piaractus brachypomus*, *P. mesopotamicus*, *Pseudoplatystoma corruscans*, *P. fasciatum*, *P. tigrinum*, *Pygocentrus nattereri*, *Raphiodon vulpinus*, *Serrasalmus marginatus*; gills; freshwater; Amazonas, Goiás, Rio Grande do Norte, São Paulo, Upper Paraná River flooplain (Lemos de Castro 1949; Yamaguti 1963; Malta and Varella 1983; Lemos de Castro 1985; Malta 1998; Figueiredo *et al.* 2000; Carvalho *et al.* 2004; Thatcher 2006; Takemoto *et al.* 2009; Eiras *et al.* 2010).
Dolops discoidalis Bouvier, 1899
Arapaima gigas, *Astronotus ocellatus*, *Hemisorubim* sp., *Hoplerythrinus unitaeniatus*, *Hoplias malabaricus*, *Leiarius marmoratus*, *Phractocephalus hemiliopterus*, *Pseudoplatystoma fasciatum*, *P. tigrinum*, *Salminus brasiliensis*; body surface; freshwater; Amazonas, Goiás, Mato Grosso, Pará (Yamaguti 1963; Lemos de Castro 1985; Malta 1982b; 1998; Thatcher 2006; Eiras *et al.* 2010).
Dolops geayi (Bouvier, 1897)
Aequidens pulcher, *Astronotus ocellatus*, *Crenicichla geayi*, *Crenicichla* sp., *Hoplias malabaricus*, *Megalodoras* sp., *Prochilodus lineatus*, *Salminus brasiliensis*; gills; freshwater; Amazonas, Upper Paraná River (Malta 1982a; Lemos de Castro 1985; Thatcher 2006; Takemoto *et al.* 2009; Eiras *et al.* 2010).
Dolops intermedia Silva, 1978
Crenicichla sp., *Hoplias malabaricus*; freshwater; Rio Grande do Sul (Silva 1978; Lemos de Castro 1985; Malta 1998).

Dolops kollari (Heller, 1857)
unknown host; freshwater; unspecified locality (Yamaguti 1963; Lemos de Castro 1985; Malta 1998; Eiras *et al.* 2010).
Dolops longicauda (Heller, 1857)
Oxydoras niger, *Potamotrygon* sp., *Pseudoplatystoma corruscans*, *Pterodoras granulosus*, *Pygocentrus nattereri*, *Salminus brasiliensis*, *S. franciscanus*; gills, body surface; freshwater; Mato Grosso, Paraná, Rio Grande do Sul, São Paulo (Moreira 1912; Carvalho 1939; Lemos de Castro 1985; Malta 1998; Takemoto *et al.* 2009; Eiras *et al.* 2010).
Dolops nana Lemos de Castro, 1950
Leporinus elongatus, *L. fasciatus*, *L. friderici*, *L. obtusidens*, *Leporinus* sp., *Salminus* sp.; gills, body surface; freshwater; Mato Grosso, Minas Gerais, Paraná, Upper Paraná River floodplain (Lemos de Castro 1950; Yamaguti 1963; Lemos de Castro 1985; Malta 1998; Guidelli *et al.* 2006; Takemoto *et al.* 2009; Eiras *et al.* 2010).
Dolops striata (Bouvier, 1899)
Hoplias malabaricus, *Leporinus fasciatus*, *Leporinus* sp., *Schizodon fasciatus*, *Synbranchus marmoratus*; body surface; freshwater; Amazonas, Rio Grande do Sul (Carvalho 1939; Malta and Varella 1983; Lemos de Castro 1985; Thatcher 2006; Eiras *et al.* 2010).
Dolops sp. 1
Cichla monoculus, *Leporinus elongatus*, *L. obtusidens*, *Pellona castelnaeana*, *Piaractus mesopotamicus*, *Plagioscion squamosissimus*, *Potamorhina latior*, *Prochilodus nigricans*, *Salminus brasiliensis*, *Schizodon borellii*, *Triportheus elongatus*; body surface; freshwater; Amazonas, Mato Grosso do Sul, São Paulo, Upper Paraná River (Lizama *et al.* 2007b; Takemoto *et al.* 2009; Eiras *et al.* 2010).
Dolops sp. 2
Prionoctus punctatus, *Pseudoplatystoma fasciatum*; body surface, gills; marine; Rio de Janeiro (Bicudo *et al.* 2005).

Subclass Copepoda Milne-Edwards, 1840
Update of Luque and Tavares (2007)

Copepoda gen. sp.
Satanoperca pappaterra; unspecified site of infestation; freshwater; Paraná (Yamada *et al.* 2007).

Order Cyclopoida Burmeister, 1834
Family Bomolochidae Claus, 1875
Acantholochus lamellatus Paschoal, Cezar and Luque, 2013
Conodon nobilis; gills; marine; Rio de Janeiro (Paschoal *et al.* 2013).

Family Ergasilidae von Nordmann, 1832
Acusicola brasiliensis Amado and Rocha, 1996
Lile piquitinga, *Opisthonema oglinum*; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Acusicola lycengraudilis Thatcher and Boeger, 1985
Lycengraulis grossidens; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Acusicola paracunula Amado and Rocha, 1996
Pellona flavipinnis, *Pseudotylosurus microps*; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Acusicola pellonidis Thatcher and Boeger, 1983
Pellona castelnaeana; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Acusicola rotunda Amado and Rocha, 1996
Lycengraulis batesii, *L. grossidens*; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Acusicola spinulosa Amado and Rocha, 1996
Lycengraulis batesii; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Acusicola tucunarense Thatcher, 1984
Cichla monoculus, *C. ocellaris*; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Acusicola sp.
Astyanax altiparanae; unspecified site of infestation; freshwater; Upper Paraná River (Takemoto *et al.* 2009; Eiras *et al.* 2010).
Amplexibranchius bryconis Thatcher and Paredes, 1985
Brycon cephalus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Amplexibranchius sp.
Leporinus obtusidens, *Prochilodus lineatus*; unspecified site of infestation; freshwater; Upper Paraná River (Takemoto *et al.* 2009; Eiras *et al.* 2010).
Anklobrachius marajoensis Thatcher, 1999
Unknown host; freshwater; unspecified locality (Eiras *et al.* 2010).
Brasergasilus anodus Thatcher and Boeger, 1983
Anodus elongatus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Brasergasilus bifurcatus Santos, Thatcher and Brasil-Sato, 2007
Pygocentrus piraya, *Serrasalmus brandtii*; gills, nasal cavities; freshwater; Minas Gerais (Santos *et al.* 2007; Eiras *et al.* 2010).
Brasergasilus guaporensis Malta, 1993
Leporinus fasciatus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Brasergasilus jaraquensis Thatcher and Boeger, 1983
Semaprochilodus insignis; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Brasergasilus mamorensis Varella and Malta, 2001
Hydrolycus scomberoides; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Brasergasilus oranus Thatcher and Boeger, 1984
Anodus elongatus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Brasergasilus sp.
Astyanax altiparanae, *Leporinus elongatus*, *L. piau*, *L. reinhardti*, *Pygocentrus piraya*; unspecified site of infestation; freshwater; Upper Paraná River (Takemoto *et al.* 2009; Eiras *et al.* 2010).
Ergasilus bryconis Thatcher, 1981
Brycon amazonicus, *B. cephalus*, *Leporinus elongatus*, *L. lacustris*, *L. obtusidens*; unspecified site of infestation; freshwater; Upper Paraná River (Takemoto *et al.* 2009; Eiras *et al.* 2010).

Ergasilus calophysus Thatcher and Boeger, 1984
Calophysus macropterus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus chelangulatus Thatcher and Brasil-Sato, 2008
Pimelodus maculatus; gills; freshwater; Minas Gerais (Thatcher and Brasil-Sato 2008a; Eiras *et al.* 2010).
Ergasilus coatiarus Araujo and Varella, 1998
Cichla monoculus, *C. orinocensis*, *C. temensis*; gills; freshwater; Amazon River (Araújo *et al.* 2009; Eiras *et al.* 2010).
Ergasilus colomesus Thatcher and Boeger, 1983
Colomesus asellus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus holobryconis Malta and Varella, 1986
Brycon pesu; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus hydrolycus Thatcher, Boeger and Robertson, 1984
Hydrolycus scomberoides; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus hypophthalmi Boeger, Martins and Thatcher, 1993
Hypophthalmus edentates, *H. fimbriatus*; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus iheringi Tidd, 1942
Hoplias malabaricus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus jaraquensis Thatcher and Robertson, 1982
Semaprochilodus insignis; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus leporinidis Thatcher, 1981
Leporinus fasciatus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus lizae Krøyer, 1863
Mugil curema; gill chamber; marine; Rio Grande do Norte (Cavalcanti *et al.* 2011).
Ergasilus orientalis Yamaguti, 1939
Potamorrhaphis guianensis; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus salmini Thatcher and Brasil-Sato, 2008
Salminus franciscanus; gills; freshwater; Minas Gerais (Thatcher and Brasil-Sato 2008b; Eiras *et al.* 2010).
Ergasilus thatcheri Engers, Boeger and Brandon, 2000
Rhamdia quelen; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus triangularis Malta, 1996
Leporinus taeniatus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus trygonophilus Domingues and Marques, 2010
Plesiotrygon iwamae, *Potamotrygon scobina*, *P. orbignyi*, *Potamotrygon* sp.; gills; freshwater; Pará (Domingues and Marques 2010).
Ergasilus turucuyus Malta and Varella, 1996
Acestrorhynchus falcatus, *A. falcirostris*; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus urupaensis Malta, 1993
Prochilodus nigricans; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus versicolor Wilson, 1911
Mugil cephalus, *M. curema*; gills; brackish; Rio Grande do Norte, São Paulo (Conroy and Conroy 1984; Cavalcanti *et al.* 2011).
Ergasilus yumaricus Malta and Varella, 1995
Pygocentrus nattereri, *Serrasalmus eigenmanni*, *S. rhombeus*; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Ergasilus sp.
Astyanax altiparanae, *A. bimaculatus*, *Mugil liza*, *Pimelodus maculatus*, *Prochilodus lineatus*, *Trachelyopterus striatulus*; gills; freshwater; Rio de Janeiro, Upper Paraná River (Takemoto *et al.* 2009; Azevedo *et al.* 2010).
Gamidactylus bryconis Varella, 1994
Brycon amazonicus, *B. melanopterus*; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Gamidactylus hoplius Varella and Malta, 1995
Hoplias malabaricus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Gamidactylus jaraquensis Thatcher and Boeger, 1984
Colossoma macropomum, *Prochilodus lineatus*, *Semaprochilodus insignis*; nasal cavity; freshwater; Paraná, Upper Paraná River (Lacerda *et al.* 2007; Takemoto *et al.* 2009; Eiras *et al.* 2010).
Gamidactylus sp.
Pimelodus maculatus; unspecified site of infestation; freshwater; Upper Paraná River (Takemoto *et al.* 2009).
Gamispatulus schizodontis Thatcher and Boeger, 1984
Hoplias lacerdae, *H. malabaricus*, *Leporinus elongatus*, *L. friderici*, *L. lacustris*, *L. obtudisens*, *Schizodon borellii*, *Serrasalmus fasciatus*, *S. maculatus*, *S. marginatus*; nasal cavity; freshwater; Minas Gerais, Paraná, Upper Paraná River (Lacerda *et al.* 2007; Guidelli *et al.* 2009; Takemoto *et al.* 2009; Eiras *et al.* 2010; Rosim *et al.* 2011).
Gamispatulus sp.
Piaractus mesopotamicus, *Prochilodus lineatus*; nasal cavity; freshwater; São Paulo, Upper Paraná River (Lizama *et al.* 2007b; Takemoto *et al.* 2009).
Gamispinus diabolicus Thatcher and Boeger, 1984
Ageneiosus inermis, *Pimelodus maculatus*; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Gauchergasilus euripedesi (Montú, 1980)
Micropogonias furnieri; gills; marine; Rio Grande do Sul (Velloso and Pereira Jr. 2010).
Miracetyma etimaruya Malta, 1993
Curimata cyprinoides, *Potamorhina latior*, *Psectrogaster essequibensis*; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Miracetyma kawa Malta, 1933
Rhaphiodon vulpinus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Miracetyma piraya Malta, 1993
Pygocentrus nattereri; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Miracetyma sp.
Pygocentrus nattereri; gills; freshwater; Amazonas (Vital *et al.* 2011).

Pindapixara tarira Malta, 1994
Hoplias malabaricus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Prehendorastrus bidentatus Boeger and Thatcher, 1990
Hypophthalmus edentatus, H. fimbriatus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Prehendorastrus monodontus Boeger and Thatcher, 1990
Hypophthalmus edentatus, H. fimbriatus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Rhinergasilus piranhus Boeger and Thatcher, 1988
Acestrorhynchus lacustris, Pygocentrus nattereri; nasal cavity; freshwater; Paraná, Upper Paraná River (Lacerda *et al.* 2007; Takemoto *et al.* 2009; Eiras *et al.* 2010).
Therodamas elongatus (Thatcher, 1986)
Plagioscion squamosissimus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Therodamas frontalis El-Rashidy and Boxshall, 2001
Mugil cephalus; gills; brackish, marine; unspecified locality (El-Rashidy and Boxshall 2001).
Therodamas tamarae Amado and Rocha, 1996
Plagioscion squamosissimus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Therodamas sp. 1
Mugil curema; gills; marine; São Paulo (Conroy and Conroy 1984).
Therodamas sp. 2
Pimelodus maculatus; unspecified site of infestation; freshwater; Upper Paraná River (Takemoto *et al.* 2009).
Urogasilus brasiliensis Rosim, Boxshall and Ceccarelli, 2013
Cichla piquiti, C. Temensis, Hoplias malabaricus; urinary bladder; freshwater; Mato Grosso (Rosim *et al.* 2013).
Vaigamus retrobarbatus Thatcher and Robertson, 1984
Unknown host; freshwater; unspecified locality (Eiras *et al.* 2010).
Vaigamus spinicephalus Thatcher and Robertson, 1984
Unknown host; freshwater; unspecified locality (Eiras *et al.* 2010).
Vaigamus sp.
Astyanax altiparanae, Cichla temensis, Pimelodus maculatus; unspecified site of infestation; freshwater; Upper Paraná River (Takemoto *et al.* 2009; Eiras *et al.* 2010).
Ergasilidae gen. sp.
Auchenipterus osteomystax, Oreochromis niloticus, Piaractus mesopotamicus; gills, nasal cavities; freshwater; São Paulo (Lizama *et al.* 2007a, b; Tavernari *et al.* 2009).

Family Lernaeidae Cobbold, 1879
Amazolernaea sannerae Thatcher and Williams, 1988
Cichla monoculus, C. temensis; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Bedsylernaea collaris Thatcher and Williams, 1988
Hoplias malabaricus; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Lernaea cyprinacea Linnaeus, 1758
Astyanax bimaculatus, Brycon cephalus, Clarias gariepinus, Colossoma macropomum, Cyprinus carpio, Franciscodoras marmoratus, Hoplias malabaricus, Leporinus macrocephalus, Leporinus sp., *Oreochromis niloticus, Pachyurus squamipennis, Piaractus mesopotamicus, Pimelodus blochii, Poecilia sphenops, Prochilodus brevis, Pseudoplatystoma corruscans, Rhamdia quelen, Schizodon intermedius, Xiphophorus maculatus*; body surface; freshwater; Paraná, Santa Catarina (Gabrielli and Orsi 2000; Piazza *et al.* 2006; Eiras *et al.* 2010).
Lernaea devastatrix Boxshall, Montú and Scharzbold, 1997
Astyanax sp., *Cyprinus carpio, Hoplias malabaricus, Rhamdia* sp.; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).
Lernaea sp.
Brycon insignis; body surface, gills; freshwater; Rio de Janeiro (Fernandes *et al.* 2006).
Lamproglena monodi Capart, 1944
Astronotus ocellatus, Cichla ocellaris, Tilapia rendalii; unspecified site of infestation; freshwater; Rio de Janeiro (Azevedo *et al.* 2010).
Lamproglena sp.
Oreochromis niloticus; gills; freshwater; São Paulo (Lizama *et al.* 2007a).
Minilernaea floricapitella Thatcher and Huergo, 2005
Astyanax sp., *Corydoras ehrhardti*; body surface; freshwater; Santa Catarina (Eiras *et al.* 2010; Boos *et al.* 2012).
Perulernaea gamitanae Thatcher and Paredes, 1985
Colossoma macropomum; unspecified site of infestation; freshwater; unspecified locality (Eiras *et al.* 2010).

Family Philichthyidae Vogt, 1877
Colobomatus sudatlanticus Pereira, Timi, Lanfranchi and Luque, 2012
Mullus argentinae; pores of cephalic sensory system and nostrils; marine; Rio de Janeiro, Rio Grande do Sul, Santa Catarina (Pereira *et al.* 2012).

Order Siphonostomatoida Thorell, 1859
Family Caligidae Burmeister, 1834
Caligus bonito Wilson, 1905
Mugil curema; gill chamber; marine; Rio Grande do Norte (Cavalcanti *et al.* 2011).
Caligus mutabilis Wilson, 1905
Mycteroperca microlepis; body surface; marine; São Paulo (Sanches *et al.* 2012).
Caligus pelamydis Krøyer, 1863
Scomber japonicus; unspecified site of infestation; marine; Rio de Janeiro (Oliva *et al.* 2008).
Caligus sp.
Mugil curema, Peprilus paru; gill chamber; Rio Grande do Norte (Azevedo *et al.* 2007; Cavalcanti *et al.* 2011).
Metacaligus trichiuri (Krøyer, 1863) *Metacaligus uruguayensis* (Thomsen, 1949)
Trichiurus lepturus; gills, mouth; marine; Rio de Janeiro (Carvalho and Luque 2011).

Family Lernaeopodidae Milne Edwards, 1840
Brachiella thynni Cuvier, 1830
Acanthocybium solandri, *Pomatomus saltarix*, *Scomberomorus cavalla*, *S. regalis*, *Thunnus albacores*, *T. obesus*, *T. thynnus*; fins; marine; Santa Catarina (Boos *et al.* 2012)
Naobranchia lizae (Krøyer, 1863)
Mugil liza; unspecified site of infestation; freshwater; Rio de Janeiro (Azevedo *et al.* 2010).

Family Lernanthropidae Kabata, 1979
Lernanthropinus trachuri (Brian,1903)
Trachurus lathami; gills; marine; Rio de Janeiro (Braicovich *et al.* 2011).

Family Pandaridae Milne Edwards, 1840
Pandarus floridanus Cressey, 1967
Prionace glauca; body surface; marine; Santa Catarina (Boss *et al.* 2012).
Pandarus satyrus Dana, 1849
Prionace glauca; body surface; marine; Santa Catarina (Boss *et al.* 2012).

Subclass Pentastomida Diesing, 1836
Order Porocephalida Heymons, 1935
Family Sebekiidae Fain, 1961
Leiperia gracile (Diesing, 1836) (larva)
Brachyplatystoma sp., *Hemisorubim platyrhynchus*, *Hoplias malabaricus*, *Phractocephalus hemioliopterus*, *Pimelodus ornatus*, *Pinirampus pirinampu*, *Pseudoplatystoma* sp., *Pygocentrus nattereri*, *Salminus franciscanus*, *Zungaro zungaro*; mesentery; freshwater; Mato Grosso, Tocantins (Motta and Gomes 1968; Rego and Eiras 1989; Eiras *et al.* 2010).
Leiperia sp. (larva)
Hoplias malabaricus, *Pseudoplatystoma fasciatum*, *Pygocentrus nattereri*; mesentery, body muscles; freshwater; Mato Grosso (Rego and Eiras 1989; Eiras *et al.* 2010).
Sebekia oxycephala (Diesing, 1835) (larva)
Electrophorus electricus, *Hoplias malabaricus*, *Phalloceros harpagos*, *Potamotrygon motoro*, *Pseudoplatystoma corruscans*, *P. fasciatus*, *Pygocentrus nattereri*, *P. piraya*, *Rhaphiodon vulpinus*, *Serrasalmus marginatus*, *Synbranchus marmoratus*; mesentery, intestine; freshwater; Mato Grosso, Mato Grosso do Sul, Paraná, Upper Paraná River (Rego 1983–1984; Rego and Eiras 1989; Takemoto *et al.* 2009; Almeida *et al.* 2010; Eiras *et al.* 2010; Vicentin *et al.* 2011).

Sebekia sp. (larva)
Apteronotus albifrons, *Arapaima gigas*, *Astronotus ocellatus*, *Astyanax mexicanus*, *Electrophorus electricus*, *Gymnotus carapo*, *Hemisorubim platyrhynchus*, *Hoplias malabaricus*, *Osteoglossum bicirrhosum*, *Pellona castelnaeana*, *Phractocephalus hemioliopterus*, *Pinirampus pirinampu*, *Potamotrygon motoro*, *Pseudoplatystoma tigrinum*, *Raphiodon vulpinus*, *Salminus franciscanus*, *Sciades herzbergii*, *Pygocentrus piraya*, *Synbranchus marmoratus*; unspecified site of infection; freshwater; Pará, Paraná (Rego and Eiras 1989; Guidelli *et al.* 2003; Eiras *et al.* 2010).

Family Subtriquetridae Fain, 1961
Subtriqueta sp. 1 (larva)
Hoplias malabaricus, *Pygocentrus nattereri*, *Serrasalmus marginatus*; unspecified site of infection; freshwater; unspecified locality (Rego 1983–1984; Eiras *et al.* 2010).
Subtriqueta sp. 2 (larva)
Serrasalmus marginatus; swimming bladder; freshwater; Mato Grosso do Sul (Vicentin *et al.* 2011).
Subtriqueta sp. 3 (larva)
Serrasalmus marginatus; swimming bladder; freshwater; Mato Grosso do Sul (Vicentin *et al.* 2011).

Host-Parasite list

(copepod species are as an update of Luque and Tavares, 2007)

Class Actinopterygii Klein, 1885
Order Anguilliformes Goodrich, 1909
Family Muraenidae Rafinesque, 1810
Gymnothorax moringa (Cuvier, 1829)
Gnathia sp.

Order Atheriniformes Rosen, 1964
Family Atherinopsidae Fitzinger, 1873
Odontesthes bonariensis (Valenciennes, 1835)
Mothocya bohlkeorum

Order Beloniformes Berg, 1937
Family Belonidae Bonaparte, 1835
Potamorrhaphis guianensis (Jardine, 1843)
Ergasilus orientalis
Pseudotylosurus microps (Günther, 1866)
Acusicola paracunula

Family Exocoetidae Rafinesque, 1810
Exocoetus sp.
Glossobius impressus

Family Hemiramphidae Gill, 1859
Hyporhamphus unifasciatus (Ranzani, 1841)
Mothocya omidaptria

Order Characiformes Regan, 1911
Family Acestrorhynchidae Eigenmann, 1912
Acestrorhynchus falcatus (Bloch, 1794)
Ergasilus turucuyus
Acestrorhynchus falcirostris (Cuvier, 1819)
Ergasilus turucuyus
Acestrorhynchus lacustris (Lütken, 1875)
Rhinergasilus piranhus
Acestrorhynchus microlepis (Jardine, 1841)
Braga amapaensis
Acestrorhynchus sp.
Dipteropeltis hirundo

Family Anostomidae Günther, 1864
Leporellus vittatus (Valenciennes, 1850)
Riggia brasiliensis
Leporinus copelandii Steindachner, 1875
Riggia brasiliensis

Leporinus elongatus Valenciennes, 1850
Argulus sp., *Brasergasilus* sp., *Ergasilus bryconis*, *Dolops nana*, *Dolops* sp., *Gamispatulus schizodontis*
Leporinus fasciatus (Bloch, 1794)
Brasergasilus guaporensis, *Dolops nana*, *D. striata*, *Ergasilus leporinidis*, *Nerocila armata*
Leporinus friderici (Bloch, 1974)
Argulus sp., *Dolops nana*, *Gamispatulus schizodontis*
Leporinus lacustris Amaral Campos, 1945
Argulus sp., *Ergasilus bryconis*, *Gamispatulus schizodontis*
Leporinus macrocephalus Garavello and Britski, 1988
Argulus sp., *Lernaea cyprinacea*
Leporinus obtusidens (Valenciennes, 1837)
Amplexibranchius sp., *Argulus* sp., *Dolops nana*, *Dolops* sp., *Ergasilus bryconis*, *Gamispatulus schizodontis*
Leporinus octofasciatus Steindachner, 1915
Riggia brasiliensis
Leporinus piau Fowler, 1941
Argulus sp., *Brasergasilus* sp.
Leporinus reinhardti Lütken, 1874
Argulus sp., *Brasergasilus* sp.
Leporinus striatus Kner, 1858
Riggia nana
Leporinus taeniatus Lütken, 1875
Ergasilus triangularis
Leporinus sp.
Argulus sp., *Dolops nana*, *D. striata*, *Lernaea cyprinacea*
Rhytiodus microlepis Kner, 1858
Argulus sp., *Dolops bidentata*
Schizodon borellii (Boulenger, 1900)
Dolops sp., *Gamispatulus schizodontis*
Schizodon fasciatus Spix and Agassiz, 1829
Argulus chicomendesi, *Argulus* sp., *Dolops bidentata*, *D. striata*, *Gamispatulus schizodontis*
Schizodon intermedius Garavello and Britski, 1990
Lernaea cyprinacea
Schizodon nasutus Kner, 1858
Riggia brasiliensis

Family Characidae Latreille, 1825
Astyanax altiparanae Garutti and Britski, 2000
Acusicola sp., *Brasergasilus* sp., *Ergasilus* sp., *Vaigamus* sp.
Astyanax bimaculatus (Linnaeus, 1758)
Argulus juparanaensis, *Ergasilus* sp., *Lernaea cyprinacea*, *Paracymothoa astyanaxi*
Astyanax fasciatus (Cuvier, 1819)
Dipteropeltis hirundo
Astyanax mexicanus (De Filippi, 1853)
Sebekia sp.
Astyanax sp.
Lernaea devastatrix, *Minilernaea floricapitella*
Brycon amazonicus (Spix and Agassiz, 1829)
Argulus chicomendesi, *Ergasilus bryconis*, *Gamidactylus bryconis*
Brycon cephalus (Günther, 1869)
Amplexibranchius bryconis, *Argulus chicomendesi*, *Argulus* sp., *Ergasilus bryconis*, *Lernaea cyprinacea*
Brycon insignis Steindachner, 1876
Lernaea sp.
Brycon melanopterus (Cope, 1872)
Dipteropeltis hirundo, *Gamidactylus bryconis*
Brycon pesu Müller and Troschel, 1845
Ergasilus holobryconis
Colossoma macropomum (Cuvier, 1816)
Argulus chicomendesi, *A. multicolor*, *Argulus* sp., *Braga patagonica*, *Dolops carvalhoi*, *Gamidactylus jaraquensis*, *Lernaea cyprinacea*, *Perulernaea gamitanae*
Galeocharax humeralis (Valenciennes, 1834)
Braga cichlae, *B. cigarra*
Galeocharax kneri (Steindachner, 1879)
Braga cigarra
Myleus rubripinnis (Müller and Troschel, 1844)
Vanamea symmetrica
Mylossoma aureum (Spix and Agassiz, 1829)
Dipteropeltis hirundo
Odontostilbe sp.
Riggia cryptocularis
Ossubtus xinguense Jégu, 1992
Anphira xinguensis
Piaractus brachypomus (Cuvier, 1818)
Dolops bidentata, *D. carvalhoi*
Piaractus mesopotamicus (Holmberg, 1887)
Argulus sp., *Dolops carvalhoi*, *Dolops* sp., Ergasilidae gen. sp., *Gamispatulus* sp., *Lernaea cyprinacea*
Pygocentrus nattereri Kner, 1858
Anphira branchialis, *Argulus chicomendesi*, *A. elongatus*, *A. juparanaensis*, *A. multicolor*, *Argulus* sp., *Asotana* sp., *Dolops bidentata*, *D. Carvalhoi*, *D. longicauda*, *Ergasilus yumaricus*, *Miracetyma piraya*, *Miracetyma* sp., *Leiperia gracile*, *Leiperia* sp., *Rhinergasilus piranhus*, *Sebekia oxycephala*, *Subtriqueta* sp.
Pygocentrus piraya (Cuvier, 1819)
Braga sp., *Brasergasilus bifurcatus*, *Brasergasilus* sp., *Dipteropeltis hirundo*, *Sebekia oxycephala*, *Sebekia* sp.
Salminus brasiliensis (Cuvier, 1816)
Argulus nattereri, *A. paranaensis*, *A. paulensis*, *A. pestifer*, *A. salminei*, *Dipteropeltis hirundo*, *Dolops discoidalis*, *D. geayi*, *D. longicauda*, *Dolops* sp.
Salminus franciscanus Lima and Britski
Argulus nattereri, *A. salminei*, *Dipteropeltis hirundo*, *Dolops longicauda*, *Ergasilus salmini*
Leiperia gracile, *Sebekia* sp.
Salminus hilarii Valenciennes, 1850
Argulus paulensis, *Braga patagonica*
Salminus sp.
Dolops nana
Serrasalmus brandtii Lütken, 1875
Brasergasilus bifurcatus
Serrasalmus eigenmanni Norman, 1929
Ergasilus yumaricus
Serrasalmus maculatus Kner, 1858
Gamispatulus schizodontis
Serrasalmus marginatus Valenciennes, 1837
Argulus elongatus, *A. juparanaensis*, *Dolops carvalhoi*, *Gamispatulus schizodontis*, *Sebekia oxycephala*, *Subtriqueta* sp. 1, *Subtriqueta* sp. 2, *Subtriqueta* sp. 3
Serrasalmus rhombeus (Linnaeus, 1766)
Ergasilus yumaricus, *Vanamea symmetrica*
Serrasalmus spilopleura Kner, 1858
Anphira branchialis, *Argulus elongatus*, *A. juparanaensis*,

Vanamea symmetrica
Serrasalmus sp.
Asotana magnifica
Triportheus albus Cope, 1872
Anphira junki
Triportheus angulatus (Spix and Agassiz, 1829)
Anphira junki
Triportheus elongatus (Günther, 1864)
Dolops sp.

Family Curimatidae Gill, 1858
Curimata cyprinoides (Linnaeus, 1766)
Miracetyma etimaruya
Curimata platana (Günther, 1880)
Riggia paranensis
Cyphocharax gilbert (Quoy and Gaimard, 1824)
Riggia paranensis
Potamorhina laticeps (Valenciennes, 1850)
Argulus sp.
Potamorhina latior (Spix and Agassiz, 1829)
Argulus sp., *Dolops* sp., *Miracetyma etimaruya*
Psectrogaster ciliata (Müller and Troschel, 1844)
Argulus sp.
Psectrogaster essequibensis (Günther, 1864)
Miracetyma etimaruya

Family Cynodontidae Eigenmann, 1903
Hydrolycus scomberoides (Cuvier, 1819)
Brasergasilus mamorensis, Ergasilus hydrolycus
Rhaphiodon vulpinus Spix and Agassiz, 1829
Argulus multicolor, Dolops bidentata, D. carvalhoi, Miracetyma kawa, Sebekia oxycephala, Sebekia sp.

Family Erythrinidae Valenciennes, 1847
Hoplerythrinus unitaeniatus (Spix and Agassiz, 1829)
Dolops discoidalis
Hoplias lacerdae Miranda Ribeiro, 1908
Braga sp., *Gamispatulus schizodontis*
Hoplias malabaricus (Bloch, 1794)
Argulus carteri, A. spinulosus, Bedsylernaea collaris, Braga patagonica, Dolops discoidalis, D. geayi, D. intermedia, D. striata, Ergasilus iheringi, Gamidactylus hoplius, G. schizodontis, Leiperia gracile, Leiperia sp., *Lernaea cyprinacea, L. devastatrix, Pindapixara tarira, Sebekia oxycephala, Sebekia* sp., *Subtriqueta* sp. 1, *Telotha henselii, Urogasilus brasiliensis*

Family Gasteropelecidae Bleeker, 1859
Carnegiella strigata (Günther, 1864)
Vanamea symmetrica

Family Hemiodontidae Bleeker, 1859
Anodus elongatus Agassiz, 1829
Brasergasilus anodus, B. oranus

Family Lebiasinidae Gill, 1893
Nannostomus beckfordi Günther, 1872
Artystone minima

Family Prochilodontidae Eigenmann, 1909
Prochilodus brevis Steindachner, 1875
Lernaea cyprinacea
Prochilodus lineatus (Valenciennes, 1837)
Dolops geayi, Ergasilus sp., *Gamidactylus jaraquensis, Gamispatulus* sp.
Prochilodus nigricans Spix and Agassiz, 1829
Argulus chicomendesi, Argulus sp., *Dolops bidentata, Dolops* sp., *Ergasilus urupaensis*
Semaprochilodus insignis (Jardine, 1841)
Brasergasilus jaraquensis, Ergasilus jaraquensis, Gamidactylus jaraquensis

Order Clupeiformes Bleeker, 1959
Family Clupeidae Rafinesque, 1810
Lile piquitinga (Schreiner and Miranda Ribeiro, 1903)
Acusicola brasiliensis
Opisthonema oglinum (Lesueur, 1818)
Acusicola brasiliensis

Family Engraulidae Gill, 1861
Cetengraulis edentulus (Cuvier, 1829)
Lironeca desterroensis, Lironeca sp. 2, Not identified Gnathiidae praniza larvae
Lycengraulis batesii (Günther, 1868)
Acusicola rotunda, A. spinulosa
Lycengraulis grossidens (Spix and Agassiz, 1829)
Acusicola lycengraudilis, A. rotunda

Family Pristigasteridae Bleeker, 1872
Pellona castelnaeana Valenciennes, 1847
Acusicola pellonidis, Dolops carvalhoi, Dolops sp., *Sebekia* sp.
Pellona flavipinnis (Valenciennes, 1837)
Acusicola paracunula
Pellona harroweri (Fowler, 1917)
Cymothoid not identified

Order Cypriniformes Bleeker, 1859
Family Cyprinidae Rafinesque, 1810
Cyprinus carpio carpio Linnaeus, 1758
Argulus coregoni, Lernaea cyprinacea, L. devastatrix

Order Cyprinodontiformes Berg, 1940
Family Anablepidae Bonaparte, 1831
Anableps anableps (Linnaeus, 1758)
Gnathia sp., Not identified *Gnathiidae praniza* larvae

Family Poeciliidae Bonaparte, 1831
Phalloceros harpagos Lucinda, 2008
Sebekia oxycephala
Poecilia sphenops Valenciennes, 1846
Lernaea cyprinacea
Xiphophorus maculatus (Günther, 1866)
Lernaea cyprinacea

Order Gadiformes Goodrich, 1909
Family Phycidae Swainson, 1838
Urophycis brasiliensis (Kaup, 1858)
Argulus sp.

Order Gymnotiformes Goodrich, 1909
Family Apteronotidae Jordan, 1923
Apteronotus albifrons (Linnaeus, 1766)
Sebekia sp.

Apteronotus brasiliensis (Reinhardt, 1852)
Telotha lunaris

Family Gymnotidae Rafinesque, 1810
Electrophorus electricus (Linnaeus, 1766)
Sebekia oxycephala, *Sebekia* sp.
Gymnotus carapo Linnaeus, 1758
Sebekia sp.

Order Mugiliformes Berg, 1940
Family Mugilidae Risso, 1827
Mugil cephalus Linnaeus, 1758
Ergasilus versicolor, *Therodamas frontalis*
Mugil curema Valenciennes, 1836
Caligus bonito, *Caligus* sp., *Cymothoa spinipalpa*, *Ergasilus lizae*, *Ergasilus versicolor*, *Therodamas* sp.
Mugil gaimardianus Desmarest, 1831
Not identified Gnathiidae praniza larvae
Mugil liza Valenciennes, 1836
Ergasilus sp., *Naobranchia lizae*

Order Osteoglossiformes Berg, 1940
Family Arapaimidae Bonaparte, 1846
Arapaima gigas (Schinz, 1822)
Argulus chicomendesi, *Argulus* sp., *Dolops carvalhoi*, *D. discoidalis*, *Sebekia* sp.
Family Osteoglossidae Bonaparte, 1846
Osteoglossum bicirrhosum (Cuvier, 1829)
Argulus amazonicus, *Sebekia* sp.

Order Perciformes Bleeker, 1859
Family Carangidae Rafinesque, 1815
Caranx latus Agassiz, 1831
Cymothoa oestrum
Caranx sp.
Cymothoa brasiliensis
Chloroscombrus chrysurus (Linnaeus, 1766)
Aegathoa sp., *Cymothoa liannae*, *C. spinipalpa*, *Cymothoa* sp. 1, *Lironeca splendida*
Oligoplites palometa (Cuvier, 1832)
Cymothoa oestrum, *C. recifea*
Oligoplites saurus (Bloch and Schneider, 1801)
Cymothoa spinipalpa
Trachurus lathami Nichols, 1920
Lernanthropinus trachuri

Family Centropomidae Poey, 1868
Centropomus undecimalis (Bloch, 1792)
Cymothoa oestrum, *C. recifea*, Cymothoid not identified

Family Cichlidae Bonaparte, 1835
Aequidens pulcher (Gill, 1858)
Dolops geayi
Astronotus ocellatus (Agassiz, 1831)
Argulus sp., *Dolops bidentata*, *D. discoidalis*, *D. geayi*, *Lamproglena monodi*, *Sebekia* sp.
Cichla monoculus Spix and Agassiz, 1831
Acusicola tucunarense, *Amazolernaea sannerae*, *Argulus amazonicus*, *Dolops* sp., *Ergasilus coatiarus*, *Vanamea symmetrica*
Cichla ocellaris Bloch and Schneider, 1801
Acusicola tucunarense, *Argulus amazonicus*, *Argulus* sp., *Braga cichlae*, *Lamproglena monodi*, *Nerocila armata*
Cichla orinocensis Humboldt, 1821
Ergasilus coatiarus
Cichla piquiti Kullander and Ferreira, 2006
Urogasilus brasiliensis
Cichla temensis Humboldt, 1821
Amazolernaea sannerae, *Argulus amazonicus*, *A. multicolor*, *Argulus* sp., *Braga cichlae*, *B. fluviatilis*, *Ergasilus coatiarus*, *Urogasilus brasiliensis*, *Vaigamus* sp.
Crenicichla geayi Pellegrin, 1903
Dolops geayi
Crenicichla lacustris (Castelnau, 1855)
Artystone trysibia
Crenicichla saxatilis (Linnaeus, 1758)
Nerocila armata
Crenicichla sp.
Dolops geayi, *D. intermedia*
Geophagus brasiliensis (Quoy and Gaimard, 1824)
Artystone trysibia, *Telotha henselii*
Geophagus sp.
Telotha henselii
Gymnogeophagus gymnogenys (Hensel, 1870)
Telotha henselii
Oreochromis niloticus (Linnaeus, 1758)
Argulus multicolor, *Argulus* sp., *Argulus spinulosus*, Ergasilidae gen. sp., *Lamproglena* sp., *Lernaea cyprinacea*
Satanoperca jurupari (Heckel, 1840)
Argulus multicolor
Satanoperca pappaterra (Heckel, 1840)
Copepoda gen. sp.
Tilapia rendalli (Boulenger, 1897)
Lamproglena monodi

Family Gempylidae Gill, 1862
Thyrsitops lepidopoides (Cuvier, 1832)
Lironeca redmanni

Family Gerreidae Bleeker, 1859
Eucinostomus argenteus Baird and Girard, 1855
Lironeca sp. 3
Eugerres brasilianus (Cuvier, 1830)
Cymothoa gerris

Family Haemulidae Gill, 1885
Conodon nobilis (Linnaeus, 1758)
Acantholochus lamellatus, Not identified Gnathiidae praniza larvae
Orthopristis ruber (Cuvier, 1830)
Lironeca redmanni

Family Mullidae Rafinesque, 1815
Mullus argentinae Hubbs and Marini, 1933
Colobomatus sudatlanticus, *Rocinela signata*

Family Percophidae Swainson, 1839
Percophis brasiliensis Quoy and Gaimard, 1825
Gnathia sp.

Family Pinguipedidae Günther, 1860
Pinguipes brasilianus Cuvier, 1829

Cymothoid not identified, *Gnathia* sp., Not identified Gnathiidae praniza larvae

Family Pomatomidae Gill, 1862
Pomatomus saltatrix (Linnaeus, 1766)
Brachiella thynni

Family Priacanthidae Günther, 1859
Priacanthus arenatus Cuvier, 1829
Gnathia sp.
Priacanthus sp.
Cymothoa ianuarii

Family Scaridae Rafinesque, 1810
Sparisoma frondosum (Agassiz, 1831)
Rocinela signata

Family Sciaenidae Cuvier, 1828
Ctenosciaena gracilicirrhus (Metzelaar, 1919)
Lironeca redmanni
Cynoscion jamaicensis (Vaillant and Bocourt, 1883)
Lironeca redmanni
Cynoscion striatus (Cuvier, 1829)
Lironeca redmanni
Menticirrhus littoralis (Holbrook, 1847)
Cymothoa catarinensis
Micropogonias furnieri (Desmarest, 1823)
Cymothoa excise, Cymothoid not identified, *Gauchergasilus euripedesi*, *Lironeca redmanni*, *Nerocila armata*
Pachyurus bonariensis Steindachner, 1879
Argulus juparanaensis
Pachyurus squamipennis Agassiz, 1831
Argulus juparanaensis, *Lernaea cyprinacea*
Plagioscion squamosissimus (Heckel, 1840)
Dolops sp., *Therodamas elongates*, *T. tamarae*
Pogonias cromis (Linnaeus, 1766)
Nerocila armata
Umbrina canosai Berg, 1895
Lironeca redmanni

Family Scombridae Rafinesque, 1810
Acanthocybium solandri (Cuvier, 1832)
Brachiella thynni
Euthynnus alletteratus (Rafinesque, 1810)
Cymothoid not identified
Scomber japonicus Houttuyn, 1782
Caligus pelamydis
Scomberomorus brasiliensis Collete, Russo and Zavala-Camin, 1978
Lironeca redmanni, *Rocinela signata*
Scomberomorus cavalla (Cuvier, 1829)
Brachiella thynni
Scomberomorus regalis (Bloch, 1793)
Brachiella thynni
Thunnus albacares (Bonnaterre, 1788)
Brachiella thynni
Thunnus obesus (Lowe, 1839)
Brachiella thynni
Thunnus thynnus (Linnaeus, 1758)
Brachiella thynni

Family Serranidae Swainson, 1839
Cephalopholis fulva (Linnaeus, 1758)
Cymothoa oestrum, *C. recifea*
Mycteroperca microlepis (Goode and Bean, 1879)
Caligus mutabilis
Paranthias furcifer (Valenciennes, 1828)
Anilocra haemuli

Family Sparidae Rafinesque, 1810
'*Sargus* sp.'
Cymothoa brasiliensis
Pagrus pagrus (Linnaeus, 1758)
Cymothoid not identified

Family Stromateidae Rafinesque, 1810
Peprilus paru (Linnaeus, 1758)
Caligus sp.

Family Trichiuridae Rafinesque, 1815
Trichiurus lepturus Linnaeus, 1758
Metacaligus trichiuri

Order Pleuronectiformes Bleeker, 1859
Family Pleuronectidae Rafinesque, 1815
'*Platessa* sp.'
Cymothoa ianuarii

Order Scorpaeniformes Greenwood, Rosen, Weitzman and Myers, 1966
Family Dactylopteridae Gill, 1861
Dactylopterus volitans (Linnaeus, 1758)
Argulus sp., Cymothoid not identified

Family Triglidae Rafinesque, 1810
Prionotus punctatus (Bloch, 1793)
Argulus sp., *Dolops* sp., *Gnathia* sp.

Order Siluriformes Cuvier, 1817
Family Ariidae Bleeker, 1862
Amphiarius phrygiatus (Valenciennes, 1840)
Not identified Gnathiidae praniza larvae
Aspistor luniscutis (Valenciennes, 1840)
Gnathia sp.
Genidens barbus (Lacépède, 1803)
Cymothoa sp. 2
Sciades herzbergii (Bloch, 1794)
Sebekia sp.

Family Auchenipteridae Bleeker, 1862
Ageneiosus inermis (Linnaeus, 1766)
Excorallana sp., *Gamispinus diabolicus*
Auchenipterus osteomystax (Miranda Ribeiro, 1918)
Ergasilidae gen. sp.
Pseudauchenipterus nodosus (Bloch, 1794)
Nerocila armata
Trachelyopterus striatulus (Steindachner, 1877)
Ergasilus sp.

Family Clariidae Bonaparte, 1846
Clarias gariepinus (Burchell, 1822)
Lernaea cyprinacea

Family Doradidae Bleeker, 1858
Doras carinatus (Linnaeus, 1766)
Vanamea symmetrica
Franciscodoras marmoratus (Lütken, 1874)
Lernaea cyprinacea
Megalodoras sp.
Argulus juparanaensis, *Dolops geayi*
Oxydoras niger (Valenciennes, 1821)
Dolops longicauda
Pterodoras granulosus (Valenciennes, 1821)
Dolops longicauda

Family Heptapteridae Gill, 1861
Rhamdia quelen (Quoy and Gaimard, 1824)
Ergasilus thatcheri, *Lernaea cyprinacea*
Rhamdia sp.
Lernaea devastatrix

Family Loricariidae Rafinesque, 1810
Ancistrus sp.
Riggia acuticaudata, *R. cryptocularis*
Hypostomus sp.
Braga nasuta
Loricariichthys anus (Valenciennes, 1835)
Braga fluviatilis

Family Mochokidae Jordan, 1923
Synodontis clarias (Linnaeus, 1758)
Telotha henselii

Family Pimelodidae Bonaparte, 1835
Brachyplatystoma Leiperia gracile, *Telotha henselii*, *Vanamea symmetrica*
Calophysus macropterus (Lichtenstein, 1819)
Ergasilus calophysus
Hemisorubim platyrhynchos (Valenciennes, 1840)
Leiperia gracile, *Sebekia* sp.
Hemisorubim sp.
Dolops discoidalis
Hypophthalmus edentatus Spix and Agassiz, 1829
Argulus chicomendesi, *Argulus* sp., *Ergasilus hypophthalmi*, *Prehendorastrus bidentatus*, *P. monodontus*
Hypophthalmus fimbriatus Kner, 1858
Ergasilus hypophthalmi, *Prehendorastrus bidentatus*, *P. monodontus*
Iheringichthys labrosus (Lütken, 1874)
Telotha silurii
Leiarius marmoratus (Gill, 1870)
Dolops discoidalis
Luciopimelodus pati (Valenciennes, 1835)
Dipteropeltis hirundo
Phractocephalus hemioliopterus (Bloch and Schneider, 1801)
Argulus sp., *Dolops carvalhoi*, *D. discoidalis*, *Leiperia gracile*, *Sebekia* sp.
Pimelodus blochii Valenciennes, 1840
Lernaea cyprinacea
Pimelodus maculatus Lacépède, 1803
Ergasilus chelangulatus, *Ergasilus* sp., *Gamidactylus* sp., *Gamispinus diabolicus*, *Telotha henselii*, *Telotha* sp., *Therodamas* sp., *Vaigamus* sp.
Pimelodus ornatus Kner, 1858
Leiperia gracile
Pinirampus pirinampu (Spix and Agassiz, 1829)
Leiperia gracile, *Sebekia* sp.
Pseudoplatystoma tigrinum (Valenciennes, 1840)
Argulus chicomendesi, *A. pestifer*, *Dolops carvalhoi*, *D. discoidalis*, *Sebekia* sp.
Pseudoplatystoma corruscans (Spix and Agassiz, 1829)
Argulus nattereri, *A. pestifer*, *Dolops carvalhoi*, *D. longicauda*, *Lernaea cyprinacea*, *Sebekia oxycephala*
Pseudoplatystoma fasciatum (Linnaeus, 1766)
Argulus juparanaensis, *A. pestifer*, *Argulus* sp., *Dolops carvalhoi*, *D. discoidalis*, *Dolops* sp., *Leiperia* sp., *Sebekia oxycephala*
Pseudoplatystoma sp.
Argulus nattereri, *Leiperia gracile*
Zungaro zungaro (Humboldt, 1821)
Leiperia gracile

Family Trichomycteridae Bleeker, 1858
Vandellia cirrhosa Valenciennes, 1846
Vanamea symmetrica

Order Synbranchiformes Regan 1909
Family Synbranchidae Bonaparte, 1835
Synbranchus marmoratus Bloch, 1795
Dolops bidentata, *D. striata*, *Sebekia oxycephala*, *Sebekia* sp.

Order Tetraodontiformes Berg, 1940
Family Balistidae Rafinesque, 1810
Balistes capriscus Gmelin, 1789
Cymothoid not identified

Family Tetraodontidae Bonaparte, 1831
Colomesus asellus (Müller and Troschel, 1849)
Ergasilus colomesus

Class Elasmobranchii Bonaparte, 1838
Order Carcharhiniformes Compagno, 1977
Family Carcharhinidae Jordan and Evermann, 1896
Prionace glauca (Linnaeus, 1758)
Pandarus floridanus
Pandarus satyrus

Family Triakidae Gray, 1851
Mustelus canis (Mitchill, 1815)
Nerocila armata

Order Rajiformes Berg, 1940
Family Potamotrygonidae Eigenmann, 1912
Plesiotrygon iwamae Rosa, Castello and Thorson, 1987
Ergasilus trygonophilus
Potamotrygon motoro (Müller and Henle, 1841)
Argulus juparanaensis, *Sebekia oxycephala*, *Sebekia* sp.
Potamotrygon orbignyi (Castelnau, 1855)
Ergasilus trygonophilus
Potamotrygon scobina Garman, 1913
Ergasilus trygonophilus
Potamotrygon sp.
Dolops longicauda, *Ergasilus trygonophilus*

Order Squaliformes Goodrich, 1909
Family Squalidae de Blainville, 1816
Squalus cubensis Howell Rivero, 1936
Lironeca splendida, *Lironeca* sp. 1

Discussion

The parasites are recognized as an important component of global biodiversity and the research effort directed to documenting parasite species has increased recently (Poulin and Morand 2004). Currently, it is estimated that around 4290 species of freshwater, brackish water and marine fishes are known in Brazil (Froese and Pauly 2013). The data from the present study combined with the information compiled by Luque and Tavares (2007) indicate that there are 279 species of fishes parasitized by crustaceans, which represents approximately 6.5% of all fish species known from Brazil. It is, therefore, reasonable to assume that the parasitic crustacean fauna in Brazil is underestimated and poorly known.

According to Luque and Poulin (2007), Latin American countries or subregions with the highest diversity of parasites of fishes (hotspots) are Brazil, Mexico and the Caribbean. These authors reported a number of 560 host-parasite associations with crustacean parasites of fishes in Brazil. The current study updates these data for a total of 747 host-parasite associations between Brazilian parasitic crustaceans and fishes. When comparing these data with those recorded for the fishes of Mexico and the Caribbean, we can affirm that the fauna of parasitic crustaceans of Brazilian fishes is the richest in Neotropical region (Table 3).

This situation is similar when compared Brazilian data with countries from other regions whose fish parasite fauna is relatively well studied. Poulin (2004) assumed that the fauna of parasites of fishes from Canada is possibly the best known in the world. According to Margolis and Arthur (1979) and McDonald and Margolis (1995) 191 species of parasitic crustaceans are known from 329 determined and undetermined species of Canadian fishes, totaling 807 parasite-host associations. By these data, we can say that there are more species of hosts and more host-parasite associations in fishes from Canada, but the richness of parasitic crustaceans in fishes from Brazil is higher, since 251 determined and undetermined species of parasitic crustaceans are reported from Brazil.

Table 1. Total of determined and undetermined crustacean parasite species according to taxonomic group and habitat.

	MALACOSTRACA	MAXILLOPODA			
Habitat	Eumalacostraca	Branchiura	Copepoda		Pentastomida
	Isopoda	Arguloida	Cyclopoida	Siphonostomatoida	Porocephalida
Freshwater	27	27	69	3	7
Marine	26	2	39	85	-
Brackish	-	-	9	2	-
Total	**53**	**29**	**117**	**90**	**7**

Table 2. Total of determined and undetermined species of parasitic crustaceans by host order and habitat.

HOST TAXA	HABITAT OF HOSTS		
	FRESHWATER	MARINE	BRACKISH
Class Actinopterygii			
Order Anguilliformes	-	1	-
Order Atheriniformes	6	1	-
Order Beloniformes	2	11	-
Order Characiformes	91	-	-
Order Clupeiformes	10	7	-
Order Cypriniformes	3	1	-
Order Cyprinodontiformes	2	-	-
Order Gadiformes	-	6	-
Order Gymnotiformes	3	-	-
Order Lamniformes	-	2	-
Order Lampriformes	-	1	
Order Mugiliformes	-	14	10
Order Ophidiiformes	5	1	-
Order Osteoglossiformes	6	-	-
Order Perciformes	29	89	-
Order Pleuronectiformes	-	5	-
Order Scorpaeniformes	-	8	-
Order Siluriformes	38	12	1
Order Synbranchiformes	4	-	-
Order Tetraodontiformes	1	8	-
Class Elasmobranchii			
Order Carcharhiniformes	-	12	1
Order Rajiformes	5	1	-
Order Squaliformes	-	2	-

Currently, it is estimated that around 1140 species of fishes are recorded in Canada (Froese and Pauly 2013) with 329 hosts species parasitized by crustaceans, which represents approximately 29% of fish species. In Brazil, the proportion of fish species parasitized by crustaceans is equivalent to 6.5% of fishes that currently occur in the country, which shows that fishes in Brazil may have the greatest richness of the parasitic crustaceans species of the world.

In the current study we detected that Ergasilidae (Copepoda) is the largest family of parasitic crustaceans in Brazil, it comprises 82 species parasitic on freshwater, brackish water and marine fish species. Aside copepods, the most species-rich family of parasitic crustaceans is the Cymothoidae (Eumalacostraca, Isopoda) with 39 species parasitizing marine and freshwater fishes.

The highest number of fish hosts (20) was recorded for the introduced *Lernaea cyprinacea* (Copepoda, Cyclopoida), according to Luque and Tavares (2007) and the present study. Another euryxenous parasite is the branchiuran arguloid *Dolops carvalhoi*, recorded from 12 species of Brazilian freshwater fishes. In marine fish, *Lironeca redmanni* (Eumalacostraca, Isopoda) has the widest host spectrum (8 host species).

Studies on parasitic crustaceans of fishes in Brazil have yielded the description of 57 new species in the last 20 years, which represents almost one fourth (22.8%) of all species reported. These data demonstrate considerable progress in Brazilian taxomic research in parasitology during the past two decades. It also shows that there is still a big potential for the discovery of new species and new records of parasitic crustaceans on Brazilian fishes, the biodiversity of which is undoubtebly underestimated.

Table 3. Number of host-parasite associations of crustaceans of fishes from Brazil, Caribbean and Mexico.

COUNTRY	ISOPODA	BRANCHIURA	COPEPODA	PENTASTOMIDA	TOTAL
Brazil (present paper)	123	157	419	48	747
Caribbean (Luque and Poulin, 2007)	82	10	329	2	423
Mexico (Luque and Poulin, 2007)	13	10	145	0	168

Acknowledgments: We wish to thank Dr. Tomáš Scholz for their valuable suggestions in review of this manuscript. José Luis Luque was supported by a Research fellowship from CNPq (Conselho Nacional de Pesquisa e Desenvolvimento Tecnológico, Brazil). Fabiano Matos Vieira was supported by a Postdoctoral fellowship from FAPERJ/CAPES (Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro/Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, Brazil).

Literature Cited

Ahyong, S.T., J.K. Lowry, M. Alonso, R.N. Bamber, G.A. Boxshall, P. Castro, S. Gerken, G.S. Karaman, J.W. Goy, D.S. Jones, K. Meland, D.C. Rogers and J. Svavarsson. 2011. Subphylum Crustacea Brünnich, 1772; p. 165-191 *In* Z.-Q. Zhang (ed.). *Animal biodiversity: an outline of higher-level classification and survey of taxonomic richness*. *Zootaxa* 3148.

Alberto, R.M.F., M.S. Goulart, E.H.L. Pereira and J.J. Bertoletti. 2001. Desenvolvimento intramarsupial de *Telotha henselii* (von Martens, 1869) (Crustacea, Isopoda, Cymothoidae). *Comunicacões do Museu de Ciências e Tecnologia da PUCRS-Serie-Zoologia* 14(1): 73-87.

Almeida, W.O., A.T. Silva-Souza and D.L. Sales. 2010. Parasitism of *Phalloceros harpagus* (Cyprinodontiformes: Poeciliidae) by *Sebekia oxycephala* (Pentastomida: Sebekidae) in the headwaters of the Cambé River, Paraná State, Brazil. *Brazilian Journal of Biology* 70(2): 457-458.

Alves, D.R. and J.L. Luque. 2001. Community ecology of the metazoan parasites of white croaker, *Micropogonias furnieri* (Osteichthyes: Sciaenidae), from the coastal zone of the State of Rio de Janeiro, Brazil. *Memórias do Instituto Oswaldo Cruz* 96(2): 145-153.

Alves, D.R. and J.L. Luque. 2006. Ecologia das comunidades de metazoários parasitos de cinco espécies de escombrídeos (Perciformes: Scombridae) do litoral do estado do Rio de Janeiro, Brasil. *Revista Brasileira de Parasitologia Veterinária* 15(4): 167-181.

Alves, D.R., A.R. Paraguassú and J.L. Luque. 2004. Metazoários parasitos da abrótea, *Urophycis brasiliensis* (Kaup, 1858) (Osteichthyes: Phycidae) do litoral do Estado do Rio de Janeiro, Brasil. *Revista Brasileira de Parasitologia Veterinária* 13(2): 49-55.

Alves, D.R., A.R. Paraguassú and J.L. Luque. 2005. Community ecology of the metazoan parasites of the grey triggerfish, *Balistes capriscus* Gmelin, 1789 and queen triggerfish *B. vetula* Linnaeus, 1758 (Osteichthyes: Balistidae) from the state of Rio de Janeiro, Brazil. *Revista Brasileira de Parasitologia Veterinária* 14(2): 71-77.

Araújo, C.S. and V.E. Thatcher. 2003. *Anphira junki* n. sp. (Isopoda, Cymothoidae) a gill chamber parasite of *Triportheus albus* and *T. flavus* (Pisces) in the Brazilian Amazon. *Amazoniana* 17(3/4): 283-290.

Araújo, C.S.O., M.C. Barros, A.L.S. Gomes, A.M.B. Varella, G.M. Viana, N.P. Silva, F.C. Fraga and S.M. Andrade. 2009. Parasitas de populações naturais e artificiais de tucunaré (*Cichla* spp.). *Revista Brasileira de Parasitologia Veterinária* 18(1): 34-38.

Azevedo, J.S., L. Gomes da Silva, C.R.S.F. Bizerril, M.D. Petreski and N.R.W. Lima. 2006. Infestation pattern and parasitic castration of the crustacean *Riggia paranensis* (Crustacea, Cymothoidea) on the fresh water fish *Cyphocharax gilbert* (Teleostei, Curimatidae). *Neotropical Ichthyology* 4(3): 363-369.

Azevedo, J.S., M.P.M. Thomé, L. Silva, R. Novelli, M. Dansa-Petretski and N.R.W. Lima. 2002. Parasitismo de *Riggia paranensis* (Crustacea, Cymothoidea) em populações de *Cyphocharax gilbert* (Teleostei, Curimatidae) do norte do Estado do Rio de Janeiro. *Boletim do Instituto de Pesca* 28(1): 61-69.

Azevedo, R.K., V.D. Abdallah and J.L. Luque. 2007. Aspectos quantitativos da comunidade de metazoários parasitos do gordinho *Peprilus paru* (Linnaeus,1758) (Perciformes: Stromateidae), do litoral do estado do Rio de Janeiro, Brasil. *Revista Brasileira de Parasitologia Veterinária* 16(1): 10-14.

Azevedo, R.K., V.D. Abdallah and J.L. Luque. 2010. Acanthocephala, Annelida, Arthropoda, Myxozoa, Nematoda and Platyhelminthes parasites of fishes from the Guandu River, State of Rio de Janeiro, Brazil. *Check List* 6(4): 659-667.

Bastos, P.B. and V.E. Thatcher. 1997. A redescription of *Riggia paranensis* Szidat, 1948 (Isopoda, Cymothoidae) based on 32 specimens from curimatid fish of Rio de Janeiro, Brazil, with a redefinition of the genus. *Memórias do Instituto Oswaldo Cruz* 92(6): 755-760.

Bicudo, A.J.A., L.E.R. Tavares and J.L. Luque. 2005. Metazoários parasitos da cabrinha *Prionotus punctatus* (Bloch, 1793) (Osteichthyes: Triglidae) do litoral do estado do Rio de Janeiro, Brasil. *Revista Brasileira de Parasitologia Veterinária* 14(1): 27-33.

Boos, H., G.B. Buckup, L. Buckup, P.B. Araujo, C. Magalhães, M.P. Almerão, R.A. Santos and F.L. Mantelatto. 2012. Checklist of the Crustacea from the state of Santa Catarina, Brazil. *Check List* 8(6): 1020-1046.

Bowen, T.A. and R.A. Heckmann. 2002. Three species of *Argulus* (Crustacea: Branchiura) infesting farmed and wild fish, a comparative study. *Proceedings of Parasitology, Karachi* 34(1): 1-24.

Boxshall, G.A. and S.H. Halsey. 2004. *An Introduction to Copepod Diversity*. London: The Ray Society. 940 p.

Boxshall, G.A. and M. Montú. 1997. Copepods parasitic on Brazilian coastal fishes: a handbook. *Nauplius* 5(1): 1-225.

Braicovich, P.E., J.L. Luque and J.T. Timi. 2011. Geographical patterns of parasite infracommunities in the rough scad, *Trachurus lathami* Nichols, in the southwestern Atlantic Ocean. *Journal of Parasitology* 98(4): 768-777.

Brasil-Lima, I.M. 1986. O gênero *Rocinela* Leach no litoral brasileiro, com descrição de duas espécies novas (Crustacea Isopoda Aegidae). *Atas da Sociedade de Biologia do Rio de Janeiro* 26(1): 11-14.

Brasil-Lima, I.M. 1998. Malacostraca – Peracarida. Isopoda – Flabellifera. Aegidae; p. 633-633 *In* P.S. Young (ed.). *Catalogue of Crustacea of Brazil*. Rio de Janeiro: Museu Nacional.

Brasil-Lima, I.M. and C.M.L. Barros. 1998. Malacostraca – Peracarida. Freshwater Isopoda. Flabellifera and Asellota; p. 645-651 *In* P.S. Young (ed.). *Catalogue of Crustacea of Brazil*. Rio de Janeiro: Museu Nacional.

Brasil-Sato, M.C. 2003. Parasitos de peixes da bacia do rio São Francisco; p. 149-165 *In* H.P. Godinho and A.L. Godinho (eds.). *Águas, peixes e pescadores do São Francisco das Minas Gerais*. Belo Horizonte: PUC Minas.

Bruce, N.L. 1986. Revision of the isopod crustacean genus *Mothocya* Costa in Hope, 1851 (Cymothoidae: Flabellifera), parasitic on marine fishes. *Journal of Natural History* 20(5): 1089-1192.

Bruce, N.L. and T.E. Bowman. 1989. Species of the parasitic isopod genera *Ceratothoa* and *Glossobius* (Crustacea: Cymothoidae) from the mouths of flying fishes and halfbeaks (Beloniformes). *Smithsonian Contributions to Zoology* 489(1): 1-28.

Brusca, R.C. 1981. A monograph on the Isopoda Cymothoidae (Crustacea) of the eastern Pacific. *Zoological Journal of the Linnean Society* 73(2): 117-199.

Burmeister, H. 1835. Beschreibung einiger neuen oder weniger bekannten Schmarotzerkrebse, nebst allgemeinen Betrachtungen über die Gruppe, welche sie angenhören. *Nova Acta Physico-Medica Academiae Caesareae Leopoldino-Carlolinae Germanicum Naturae Curiosorum* 17(1): 269-336.

Campos, C.M., V.E. Fonseca, R.M. Takemoto and F.R. Moraes. 2008. Fauna parasitária de cachara *Pseudoplatystoma fasciatum* (Siluriforme: Pimelodidae) do rio Aquidauana, Pantanal Sul Mato-grossense, Brasil. *Acta Scientiarum, Biological Sciences* 30(1): 91-96.

Carvalho, A.R. and J.L. Luque. 2011. Seasonal variation in metazoan parasites of *Trichiurus lepturus* (Perciformes: Trichiuridae) of Rio de Janeiro, Brazil. *Brazilian Journal of Biology* 71(3): 771-782.

Carvalho, J.P. 1939. Sobre dois parasitos do gênero *Dolops* encontrados em peixes de água doce. *Revista de Industria Animal* 2(4): 109-116.

Carvalho, J.P. 1941. Sobre *Dipteropeltis hirundo* Calman, crustáceo (Branchiura) parasito de peixes d'água doce. *Boletim da Faculdade de Filosofia, Ciências e Letras, Universidade de São Paulo* 22(5): 265-275.

Carvalho, L.N., R. Arruda and K. Del-Claro. 2004. Host-parasite interactions between the piranha *Pygocentrus nattereri* (Characiformes: Characidae) and isopods and branchiurans (Crustacea) in the rio Araguaia basin, Brazil. *Neotropical Ichthyology* 2(2): 93-98.

Carvalho, S., G.M. Guidelli, R.M. Takemoto and G.C. Pavanelli. 2003. Ecological aspects of endoparasite fauna of *Acestrorhynchus lacustris* (Lütken, 1875) (Characiformes – Acestrorhynchidae) on the upper Paraná river floodplain, Brazil. *Acta Scientiarum, Biological Sciences* 25(2): 479-483.

Cavalcanti, E.T.S., S.K.S. Nascimento, N.H.C. Barros and S. Chellappa. 2012. Occurrence of the isopod parasite *Rocinela signata* (Isopoda: Aegidae) on marine fish *Sparisoma frondosum* (Osteichthyes: Scaridae). *Journal of the Marine Biological Association of the United Kingdom* 5(1): 1-4.

Cavalcanti, E.T.S., R.M. Takemoto, L.C. Alves, S. Chellappa and G.C. Pavanelli. 2011. Ectoparasitic crustaceans on mullet, *Mugil curema* (Osteichthyes: Mugilidae) in the coastal waters of Rio Grande do Norte, Brazil. *Acta Scientiarum, Biological Sciences* 33(3): 357-362.

Conroy, G. and D.A. Conroy. 1984. Diseases and parasites detected in grey mullets (Mugilidae) from coastal waters of São Paulo State, Brasil. I. Adult silver mullet (*Mugil curema* Val., 1836). *Rivista Italiana di Piscicoltura e Ittiopatologia* 1(1): 13-28.

Cordeiro, A.S. and J.L. Luque. 2005. Metazoan parasites of flying gurnards, *Dactyloperus volitans* (Linnaeus, 1758) (Osteichthyes: Dactylopteridae) from the coastal zone of the State of Rio de Janeiro, Brazil. *Acta Scientiarum, Biological Sciences* 27(2): 119-123.

Costa, E.F.S. and S. Chellappa. 2010. New host record, *Chloroscombrus chrysurus* (Osteichthyes, Carangidae) for *Livoneca redmanni* (Leach) (Isopoda, Cymothoidae) and host-parasite interaction in the Brazilian coastal waters. *Brazilian Journal of Oceanography* 58(4): 73-77.

Costa, E.F.S., M.R. Oliveira and S. Chellappa. 2010. First record of *Cymothoa spinipalpa* (Isopoda: Cymothoidae) parasitizing the marine fish Atlantic bumper, *Chloroscombrus chrysurus* (Osteichthyes: Carangidae) from Brazil. *Journal of the Marine Biological Association of the United Kingdom* 3(1): 1-6.

Dana, J.D. 1852. Conspectus crustaceorum quae in orbis terrarum circumnavigatione Carolo Wilkes e classe reipublicae faederatae duce. Pars II. *Proceedings of the American Academy of Arts and Sciences* 2(1): 9-61.

Dana, J.D. 1853. Subclass II. Crustacea Edriophthalmia, p. 691-805 *In Crustacea*. United States Exploring Expedition During the Years 1838, 1839, 1840, 1841, 1842; Under the Command of Charles Wilkes.

Delaney, P.M. 1989. Phylogeny and biogeography of the marine isopod family Corallanidae (Crustacea, Isopoda, Flabellifera). *Contributions in Science* 409(1): 1-75.

Diniz, D.G., J.E.A. Varella, M.D.F. Guimarães, A.F.L. Santos, R.Y. Fujimoto, K.C. Monfort, M.A.B. Pires, M.L. Martins and J.C. Eiras. 2008. A note on the occurrence of praniza larvae of Gnathiidae (Custacea, Isopoda) on fishes from northeast of Pará, Brazil. *Anais da Academia Brasileira de Ciências* 80(4): 657-664.

Domingues, M.V. and T.M. Marques. 2010. *Ergasilus trygonophilus* sp. nov. (Copepoda: Ergasilidae) a branchial parasite of freshwater stingrays (Potamotrygonidae) from State of Pará, Brazil. *Zoologia* 27(5): 829-833.

Eiras, J.C., R.M. Takemoto and G.C. Pavanelli. 2010. *Diversidade dos parasitas de peixes de água doce do Brasil.* Maringá, Brasil: Cliche Tec Editora. 333 p.

El-Rashidy, H. and G.A. Boxshall. 2001. The mesoparasitic genera of the Ergasilidae (Copepoda): with descriptions of new species of *Paeonodes* Wilson and *Therodamas* Krøyer. *Systematic Parasitology* 50(3): 199-217

Fernandes, G.Q., M.A. Vieira, D.G. De-Mattos-Jr. and G. Souza. 2006. Levantamento de parasitos em infrapopulação de *Brycon insignis* Steindachner, 1876 (Pisces, Characidae), criada na região norte fluminense, Rio de Janeiro, Brasil. *Ciência Animal Brasileira* 7(3): 309-313.

Figueiredo, F.V., A.M. Silva and S. Chellappa. 2000. Relação parasita-hospedeiro entre *Dolops carvalhoi* (Crustacea: Branchiura) e tambaqui, *Colossoma macropomum* (Osteichthyes: Characoidei) do RN. *Revista de Ecologia Aquática Tropical* 10(2): 101-105.

Froese, R. and D. Pauly. 2013. FishBase. Eletronic Database accessible at http://www.fishbase.org. Captured on 10 May 2013.

Gabrielli, M.A. and M.L. Orsi. 2000. Dispersão de *Lernaea cyprinacea* (Linnaeus) (Crustácea, Copepoda) na região norte do estado do Paraná, Brasil. *Revista Brasileira de Biologia* 17(2): 395-399.

Guidelli, G., R.M. Takemoto and G.C. Pavanelli. 2009. Ecologia das infrapopulações ectoparasitas das cavidades nasais de *Leporinus lacustris* (Anostomidae) da planície de inundação do alto rio Paraná, Brasil. *Acta Scientiarum, Biological Sciences* 31(2): 209-214.

Guidelli, G.M., A. Isaac, R.M. Takemoto and G.C. Pavanelli. 2003. Endoparasite infracommunities of *Hemisorubim platyrhynchos* (Valenciennes, 1840) (Pisces: Pimelodidae) of the Baía River, upper Paraná River floodplain, Brazil: specific composition and ecological aspects. *Brazilian Journal of Biology* 63(2): 261-268.

Guidelli, G.M., W.S.G. Tavechio, R.M. Takemoto and G.C. Pavanelli. 2006. Parasite fauna of *Leporinus lacustris* and *Leporinus friderici* (Characiformes, Anastomidae) from the upper Paraná river floodplain, Brazil. *Acta Scientiarum, Biological Sciences* 28(3): 281-290.

Heller, C. 1857. Beitrage zur Kenntniss der Siphonostomen. *Sitzungsberichte der Kaiserlich Akademie der Wissenschaften in Wien* 25(1): 89-113.

Heller, C. 1865. Crustaceen. Reise der Österreichischen. Fregatte Novara und die Erde in den Jahren 1857, 1858, 1859. *Zoologischer Theil* 2(3): 1-280.

Ho, J.-S. 1998a. Maxillopoda – Copepoda. Poecilostomatoida. Marine Parasites; p. 235-240 *In* P.S. Young (ed.). *Catalogue of Crustacea of Brazil.* Rio de Janeiro: Museu Nacional.

Ho, J.-S. 1998b. Maxillopoda – Copepoda. Siphonostomatoida.; p. 251-260 *In* P.S Young (ed.). *Catalogue of Crustacea of Brazil*. Rio de Janeiro: Museu Nacional.

Huizinga, H.W. 1972. Pathobiology of *Artystone trysibia* Schiödte (Isopoda: Cymothoidae), an endoparasitic isopod of South American freshwater fishes. *Journal of Wildlife Diseases*, 8, 225–232.

Junker, K., J. Boomker and D.G. Booyse. 1998. Pentastomid infections in cichlid fishes in the Kruger National Park and the description of the infective larva of *Subtriquetra rileyi* n. sp. *Onderstepoort Journal of Veterinary Research* 65(3): 159-167.

Krøyer, H. 1863. Bidrag til Kundskab om Snyltekrebsene. *Naturhistorisk Tidsskrift* 3(2): 75-426.

Lacerda, A.C.F., R.M. Takemoto, M.L.A.P. Lizama and G.C. Pavanelli. 2007. Parasitic copepods in the nasal fossae of five fish species (Characiformes) from the upper Paraná river floodplain, Paraná, Brazil. *Acta Scientiarum, Biological Sciences* 29(4): 429-435.

Lemos de Castro, A. 1949. Contribuição ao conhecimento dos crustáceos argulídeos do Brasil (Branchiura: Argulidae), com descrição de uma nova espécie. *Boletim do Museu Nacional* 93: 1-8.

Lemos de Castro, A. 1950. Contribuição ao conhecimento dos crustáceos argulídeos do Brasil. II. Descrição de duas espécies novas. *Anais da Academia Brasileira de Ciências* 22(2): 245-252.

Lemos de Castro, A. 1955. "*Paracymothoa astyanaxi*" g. n. esp. n. Isópode parasita de peixe de água doce (Isopoda, Cymothoidae). *Revista Brasileira de Biologia* 15(4): 411-414.

Lemos de Castro, A. 1959. Sobre as espécies sulamericanas do gênero *Braga* Schiödte & Meinert (Isopoda Cymothoidae). *Arquivos do Museu Nacional* 44(1): 69-95.

Lemos de Castro, A. 1985. Branchiura; p. 1-23 *In* R. Schaden (ed.). *Manual de Identificação de Invertebrados Límnicos do Brasil*. Brasília: CNPq/MCT.

Lemos de Castro, A. and J. Loyola e Silva. 1985. Isopoda; p. 1-20 *In* R. Schaden (ed.). *Manual de Identificação de Invertebrados Límnicos do Brasil*. Brasília: CNPq/MCT.

Lemos de Castro, A. and J.P. Machado Filho. 1946. "*Artystone trysbia*" Schiödte, um crustáceo parasita de peixe de água doce do Brasil, com descrição do alótipo macho (Isopoda, Cymothoidae). *Revista Brasileira de Biologia* 6(3): 407-413.

Lima, J.T.A.X., S. Chellappa and V.E. Thatcher. 2005. *Lironeca redmanni* Leach (Isopoda, Cymothoidae) e *Rocinela signata* Schioedte & Meinert (Isopoda, Aegidae), ectoparasitos de *Scomberomorus brasiliensis* Collette, Russo & Zavala-Camin (Ostheichthyes, Scombridae) no Rio Grande do Norte, Brasil. *Revista Brasileira de Zoologia* 22(4): 1104-1108.

Lima, N.R.W., J.S. Azevedo, L.G. Silva and M. Dansa-Petretski. 2007. Parasitic castration, growth, and sex steroids in the freshwater bonefish *Cyphocharax gilbert* (Curimatidae) infested by *Riggia paranensis* (Cymothoidea). *Neotropical Ichthyology* 5(4): 471-478.

Lizama, M.L.A.P., R.M. Takemoto, M.J.T. Ranzani-Paiva, L.M.S. Ayroza and G.C. Pavanelli. 2007a. Relação parasito-hospedeiro em peixes de pisciculturas da região de Assis, Estado de São Paulo, Brasil. 1. *Oreochromis niloticus* (Linnaeus, 1757). *Acta Scientiarum, Biological Sciences* 29(2): 223-231.

Lizama, M.L.A.P., R.M. Takemoto, M.J.T. Ranzani-Paiva, L.M.S. Ayroza and G.C. Pavanelli. 2007b. Relação parasito-hospedeiro em peixes de pisciculturas da região de Assis, Estado de São Paulo, Brasil. 2. *Piaractus mesopotamicus* (Holmberg, 1887). *Acta Scientiarum, Biological Sciences* 29(4): 437-445.

Luque, J.L., N.N. Felizardo and L.E.R. Tavares. 2008. Community ecology of the metazoan parasites of namorado sandperches, *Pseudopercis numida* Miranda-Ribeiro, 1903 and *P. semifasciata* Cuvier, 1829 (Perciformes: Pinguipedidae), from the coastal zone of the State of Rio de Janeiro, Brazil. *Brazilian Journal of Biology* 68(2): 269-278.

Luque, J.L., F.P. Porrozzi and D.R. Alves. 2002. Community ecology of the metazoan parasites of Argentine goatfish *Mullus argentineus* (Osteichthyes: Mullidae) from the coastal zone of the State of Rio de Janeiro, Brazil. *Revista Brasileira de Parasitologia Veterinária* 11(1): 33-38.

Luque, J.L. and R. Poulin. 2007. Metazoan parasite species richness in Neotropical fishes: hotspots and the geography of biodiversity. *Parasitology* 134(6): 865-878.

Luque, J.L. and L.E.R. Tavares. 2007. Checklist of Copepoda associated with fishes from Brazil. *Zootaxa* 1579: 1-39.

Malta, J.C.O. 1982a. Os argulídeos (Crustacea. Argulidae) da Amazônia Brasileira. Aspectos da ecologia de *Dolops discoidalis* Bouvier, 1899 e *D. bidentata* Bouvier, 1899. *Acta Amazonica* 12(3): 521-528.

Malta, J.C.O. 1982b. Os argulídeos (Crustacea: Argulidae) da Amazônia brasileira, 2. Aspectos da ecologia de *Dolops geayi* Bouvier, 1899 e *Argulus juparanaensis* Lemos de Castro, 1950. *Acta Amazonica* 12(4): 701-705.

Malta, J.C.O. 1983. Os argulídeos (Crustacea: Argulidae) da Amazônia brasileira. Aspectos da ecologia de *Argulus multicolor* Stekhoven, 1937 e *A. pestifer* Ringuelet, 1948. *Acta Amazonica* 13(3-4): 489-496.

Malta, J.C.O. 1998. Maxillopoda. Branchiura; p. 67-74 *In* P.S. Young (ed.). *Catalogue of Crustacea of Brazil*. Rio de Janeiro: Museu Nacional.

Malta, J.C.O. and E.N. Santos-Silva. 1986. *Argulus amazonicus* n. sp., crustáceo parasita de peixes da Amazônia Brasileira (Crustacea: Argulidae). *Amazoniana* 9(4): 485-492.

Malta, J.C.O. and A.M. Varella. 1983. Os argulídeos (Crustacea: Argulidae) da Amazônia brasileira. Aspectos da ecologia de *Dolops striata* Bouvier, 1899 e *D. carvalhoi* Lemos de Castro, 1949. *Acta Amazonica* 13(2): 299-306.

Malta, J.C.O. and A.M. Varella. 2000. *Argulus chicomendesi* sp. n. (Crustacea: Argulidae) parasita de peixes da Amazônia brasileira. *Acta Amazonica* 30(1): 481-489.

Margolis, L. and J.R. Arthur. 1979. *Synopsis of the parasites of fishes of Canada. Bulletin of the Fisheries Research Board of Canada no. 199.* Ottawa: Department of Fisheries and Oceans Canada. 269 p.

Martin, J.W. and G.E. Davis. 2001. An updated classification of the recent Crustacea. *Natural History Museum of Los Angeles County Science Series, Los Angeles* 39(1): 1-124.

Melo-Leitão, C.F. 1914. *Moreiriella*. *Lavoura* 17(1): 11-12.

McDonald, T.E. and L. Margolis. 1995. *Synopsis of the parasites of fishes of Canada supplement (1978–93). Canadian Special Publication of Fisheries and Aquatic Sciences, 122*. Ottawa: National Research Council of Canada. 265 p.

Monfort, K.C.F., R.Y. Fujimoto, J.E.A. Varella, M.D.F. Guimarães, A.F.L. Santos, D.G. Diniz and M.A.L. Pires. 2009. Ocorrência de *Livoneca desterroensis* (Isopoda, Cymothoidae) parasita de sardinha – *Cetengraulis edentulus* (Cuvier, 1828) (Engraulidae, Clupeiforme) capturadas na região do Nordeste Paraense, Brasil. *Boletim do Instituto de Pesca* 35(4): 657-662.

Moreira, C. 1912. Crustacés du Brésil. *Memoires de la Société Zoologique de France* 25(1): 145-153.

Moreira, P.S. 1972. Species of marine Isopoda (Crustacea Peracarida) from southern Brazil. *Boletim do Instituto Oceanográfico* 21: 163-179.

Moreira, P.S. 1973. Espécies de Isopoda (Crustacea, Peracarida). Programa Rio Grande do Sul II Parte I. *Publicação Especial do Instituto Oceanográfico* 3(2): 213-229.

Motta, C.S and D.C. Gomes. 1968. Novo hospedeiro intermediário de *Leiperia gracile* (Diesing, 1835) (Porocephaliformes, Linguatulida). *Atas Sociedade de Biologia* 12(1): 67–68.

Oliva, M.E., I.M. Valdivia, G. Costa, N. Freitas, M.A. Pinheiro de Carvalho, L. Sanchez and J.L. Luque. 2008. What can metazoan parasites reveal about the taxonomy of *Scomber japonicus* Houttuyn in the coast of South America and Madeira Islands? *Journal of Fish Biology* 72(3): 545-554.

Paraguassú, A.R., J.L. Luque and D.R. Alves. 2002. Community ecology of metazoan parasites of red porgy *Pagrus pagrus* (Osteichthyes: Sparidae) from the coastal zone of the State of Rio de Janeiro, Brazil. *Acta Scientiarum* 24(2): 461-467.

Paschoal, F., A.D. Cezar and J.L. Luque. 2013. A new species of *Acantholochus* (Cyclopoida, Bomolochidae) parasitic on the barred grunt *Conodon nobilis* (Linnaeus, 1758) (Osteichthyes, Haemulidae) from Rio de Janeiro, Brazil. *Crustaceana* 86(2): 212-220.

Peralta, A.S.L., J.L. Carvalho Jr., E. Matos and N.M.S. Freire. 1998. Ocorrência de *Argulus juparanaensis* Lemos de Castro, 1950 (Branchiura: Argulidae) em arraia de fogo *Potamotrygon motoro* (Miller & Henle, 1841) (Rajiforme: Potamotrygonidae) no igarapé do salito, município de Cachoeira do Arari, Marajó, Estado do Pará. *Entomologia e Vectores* 5(1): 49-54.

Pereira, A.N., J.T. Timi, A.L. Lanfranchi & J.L. Luque. 2012. A new species of *Colobomatus* (Copepoda, Phylichthyidae) parasitic on *Mullus argentinae* (Perciformes, Mullidae) from South American Atlantic coasts. *Acta Parasitologica* 57(3): 323-328.

Piazza, R.S., M.L. Martins, L. Guiraldelli & M.M. Yamashita. 2006. Parasitic diseases of freshwater ornamental fishes commercialized in Florianópolis, Santa Catarina, Brazil. *Boletim do Instituto de Pesca* 32(1): 51-57.

Pires-Vanin, A.M.S. 1998. Malacostraca – Peracarida. Marine Isopoda. Anthuridea, Asellota (Pars), Flabellifera (Pars), and Valvifera; p. 605-623 *In* P.S. Young (ed.). *Catalogue of Crustacea of Brazil.* Rio de Janeiro: Museu Nacional.

Poore, G.C.B and N.L. Bruce. 2012. Global diversity of marine isopods (except Asellota and crustacean symbionts). *PLos ONE* 7(8): 1-15.

Poulin, R. 2004. Parasite species richness in New Zealand fishes: a grossly underestimated component of biodiversity? *Diversity and Distributions* 10(1): 31-37.

Poulin, R. and S. Morand. 2004. *Parasite Biodiversity*. Washington, DC.: Smithsonian Books. 216 p.

Rego, A.A. 1983–1984. Sinopse dos pentastomídeos da região neotropical. *Garcia de Orta, Série Zoológica* 11(1): 45-56.

Rego, A.A. and J.C. Eiras. 1989. Identificação de larvas de *Sebekia* e *Leiperia* (Pentastomida). Histopatologia em peixes de rios. *Revista Brasileira de Biologia* 49(2): 591–595.

Richardson, H. 1911. Description d'un nouveau isopode du genre *Braga* provenant d'une rivière de l'Amérique du Sud. *Bulletin du Museum Nationale d'Histoire Naturelle, Paris* 17(1): 94-96.

Ringuelet, R. 1943. Revision de los argúlidos argentinos (Crustacea. Branchiura) com el catálogo de las especies neotropicales. *Revista del Museo de La Plata* 3(19): 43-100.

Rosim, D.F., G.A. Boxshall and P.S. Ceccarelli. 2013. A novel microhabitat for parasitic copepods: A new genus of Ergasilidae (Copepoda: Cyclopoida) from the urinary bladder of a freshwater fish. *Parasitology International* 62(4): 347-354.

Rosim, D.F., R.L.B. Mesquita and J.L. Luque. 2011. Occurrence of *Gamispatulus schizodontis* Thatcher & Boeger, 1984 (Cyclopoida, Ergasilidae) in the nasal cavities of Erythrinidae fishes from Brazil. *Pan-American Journal of Aquatic Sciences* 5(1): 153-156.

Sadowsky, V. and P.S. Moreira. 1981. Occurrence of *Squalus cubensis* Rivero, 1936, in western South Atlantic ocean, and incidence of its parasitic isopod *Lironeca splendida* sp. n. *Studies on Neotropical Fauna and Environment* 16(3): 137-150.

Sanches, E.G., C.E. Kerber, F. Paschoal and J.L. Luque. 2012. First record of *Caligus mutabilis* (Copepoda: Caligidae) in sea-farmed *Mycteroperca microlepis* (Perciformes: Serranidae) in Brazil. *Revista Brasileira de Parasitologia Veterinária* 21(3): 330-333.

Santos, M.D., V.E. Thatcher and M.C. Brasil-Sato. 2007. *Brasergasilus bifurcatus* sp. nov. (Copepoda, Ergasilidae, Abergasilinae) from the gills and nasal fossae of serrasalmid fishes from the Três Marias Reservoir, Upper São Francisco River, Minas Gerais State, Brazil. *Acta Parasitologica* 52(3): 268-272.

Sartor, S.M. 1986. Incidência de isópodes parasitas (Cymothoidae) em peixes da plataforma continental Brasileira. *Boletin do Instituto Oceanográfico* 34(1): 1-12.

Sartor, S.M. 1987. Desenvolvimento marsupial e ciclo de vida de *Cymothoa liannae* Sartor & Pires (Isopoda, Cymothoidae), parasita de peixes. *Boletim do Instituto Oceanográfico* 35(1): 43-51.

Sartor, S.M. and A.M.S. Pires. 1988. The occurrence of *Cymothoa liannae*, a new species of cymothoid isopod from Brazil, with a comparative study of its post-marsupial development. *Crustaceana* 55(2): 147-156.

Schiödte, J.C. 1866. Krebsdyrenes Sugemund. *Naturhistorisk Tidsskrift, Ser. 3* 4: 169-206.

Schiödte, J.C. and E. Meinert. 1881. Symbolae ad Monographian Cymotoarum Crustaceorum Isopodus Familie. IV Cymothoidae. *Naturhistorisk Tidsskrift, Ser. 3* 14: 221-454.

Silva, N.M.M. 1978. Uma nova espécie de crustáceo argulideo no Rio Grande do Sul, Brasil (Branchiura: Argulidae). *Iheringia, Série Zoologia* 52(1): 3-29.

Silva, N.M.M. 1980. *Argulus spinulosus* sp. n. (Branchiura: Argulidae), em peixes de água doce do Rio Grande do Sul, Brasil. *Iheringia, Série Zoologia* 56(1): 15-23.

Silva-Souza, A.T., V.D. Abdallah, R.K. Azevedo and J.L. Luque. 2011. Expanded description of *Dolops bidentata* (Bouvier, 1899) (Branchiura: Argulidae) based on specimens collected on *Pygocentrus nattereri* Kner, 1858 (Characiformes) from Poconé Wetland, MT, Brazil. *Brazilian Journal of Biology* 71(1): 145-149.

Szidat, L. 1948. *Riggia paranensis* n. g., n. sp. un isópodo parásito de la cavidad del cuerpo de "*Curimata platana*" Günther, del Rio Paraná (y descripción del huesped por el Prof. Alberto Nani). *Revista do Instituto Nacional Museu Argentino de Ciencias Naturales Bernadirno Rivadavia, Ciencias Zoológicas* 1(2): 57-65.

Szidat, I. and O. Schubart. 1960. Neue und seltene parasitische Süsswasser-Asseln der Familie Cymothoidae aus dem Rio Mogi Guassu, Brasilien (Isopoda). *Anais da Academia Brasileira de Ciências* 32(1): 107-124.

Taberner, R. 1986. Redescription y position de *Philostomela cigarra* Szidat y Schubart, 1960 (Isopoda: Cymothoidae). *Physis, Section B* 44(107): 95-101.

Takemoto, R.M., G.C. Pavanelli, M.A.P. Lizama, A.C.F. Lacerda, F.H. Yamada, L.H.A. Moreira, T.L. Ceschini and S. Bellay. 2009. Diversity of parasites of fish from the Upper Paraná River floodplain, Brazil. *Brazilian Journal of Biology* 69(suppl. 2): 691-705.

Tavares, L.E.R., J.L. Luque and S.L. Botelho Neto. 2001. Ecologia da comunidade de metazoários parasitos do olho-decão, *Priacanthus arenatus* (Cuvier, 1829) (Osteichthyes: Priacanthidae) do litoral do Estado do Rio de Janeiro, Brasil. *Revista Brasileira de Zoociências* 3(1): 45-59.

Tavares, L.E.R. and J.L. Luque. 2004. Community ecology of the metazoan parasites of common snook *Centropomus undecimalis* (Osteichthyes: Centropomidae) from the coastal zone of the State of Rio de Janeiro, Brazil. *Brazilian Journal of Biology* 64(3): 523-529.

Tavares-Dias, M., F.R. Moraes, M.L. Martins and S.N. Kronka. 2001. Fauna parasitária de peixes oriundos de "pesque-pagues" do município de Franca, São Paulo, Brasil. 11. Metazoários. *Revista Brasileira de Zoologia* 18(suppl. 1): 81-95.

Tavernari, F.C., R.M. Takemoto, G.M. Guidelli, M.L.A.P. Lizama, A.C.F. Lacerda and G.C. Pavanelli. 2009. Parasites of *Auchenipterus osteomystax* (Osteichthyes, Auchenipteridae) from two different environments, Rosana's reservoir and upper Paraná river floodplain, Brazil. *Acta Scientiarum, Biological Sciences* 31(1): 49-54.

Thatcher, V.E. 1988. *Asotana magnifica* n. sp. (Isopoda; Cymothoidae) an unusual parasite (commensal?) of the buccal cavities of piranhas (*Serrasalmus* sp.) from Roraima, Brazil. *Amazoniana* 10(3): 239-248.

Thatcher, V.E. 1993a. *Anphira branchialis* gen. et sp. nov (Isopoda, Cymothoidae) a gill cavity parasite of piranhas (*Serrasalmus* spp.) in the Brazilian Amazon. *Acta Amazonica* 23(2-3): 297-307.

Thatcher, V.E. 1993b. *Vanamea* gen. nov. (Isopoda; Cymothoidae) for *Lironeca symmetrica* Van Name, 1925, and a redescription of the species based on specimens from Brazilian piranhas. *Acta Amazonica* 23(2-3): 287-296.

Thatcher, V.E. 1995. *Anphira xinguensis* sp. nov.: a gill chamber parasite of an Amazonian serrasalmid fish *Ossubtus xinguense* Jégu, 1992. *Amazoniana* 13(3/4): 293-303.

Thatcher, V.E. 1996. *Braga amapaensis* n. sp. (Isopoda, Cymothoidae), a mouth cavity parasite of the Amazonian fish, *Acestrorhynchus guyanensis* Menezes. *Amazoniana* 14(1/2): 121-129.

Thatcher, V.E. 2000. The isopod parasites of South American fishes; p. 193-226 *In* G. Salgado-Maldonado, A.N.G. Aldrete and V.M. Vidal-Martínez (eds.). *Metazoan in the Neotropics: A Systematic and Ecological Perspective*. México: Instituto de Biología de la Universidad Nacional Autónoma de México.

Thatcher, V.E. 2002. The isopods of south american fishes. *Boletim do Museu Paraense Emílio Goldi, Série Zoologia* 18(2): 77-199.

Thatcher, V.E. 2006. *Amazon Fish Parasites.* Moscow: Pensoft Publishers, Sofia. 508 p.

Thatcher, V.E., G.S. Araújo, J.T.A.X. Lima and S. Chellappa. 2007. *Cymothoa spinipalpa* sp. nov. (Isopoda, Cymothoidae) a buccal cavity parasite of the marine fish, *Oligoplites saurus* (Bloch & Schneider) (Osteichthyes, Caranguidae) of Rio Grande do Norte State, Brazil. *Revista Brasileira de Zoologia* 24(1): 238-245.

Thatcher, V.E. and M.A. Brasil-Sato. 2008a. *Ergasilus chelangulatus* sp. nov. (Copepoda, Ergasilidae), a branchial parasite of the freshwater catfish, *Pimelodus maculatus*, from the Upper São Francisco River, Brazil. *Revista Brasileira de Zoologia* 25(3): 512-514.

Thatcher, V.E. and M.A. Brasil-Sato. 2008b. *Ergasilus salmini* sp. nov. (Copepoda, Ergasilidae), a branchial parasite of "dourado", *Salminus franciscanus*, from the Upper São Francisco River, Brazil. *Revista Brasileira de Zoologia* 25(3): 555-557.

Thatcher, V.E. and M.L. Carvalho. 1988. *Artystone minima* n. sp. (Isopoda, Cymothoidae) a body cavity parasite of the pencil fish (*Nannostomus beckfordi* Günther) from the Brazilian Amazon. *Amazoniana* 10(3): 255-265.

Thatcher, V.E. and F.T. Fonseca. 2005. *Cymothoa recifea* sp. nov. (Isopoda, Cymothoidae) from the mouths of marine fishes of Pernambuco State, Brazil. *Revista Brasileira de Zoologia* 22(3): 517-523.

Thatcher, V.E., L.P.C. Lopes and O. Froelich. 2002. *Riggia acuticaudata* sp. n. (Isopoda, Cymothoidae) from the body cavity of a freshwater fish of Mato Grosso do Sul State, Brasil. *Revista Brasileira de Zoologia* 19 (Supl. 2): 195-201.

Thatcher, V.E., A.A.N. Oliveira and A.M. Garcia. 2009. *Braga cigarra* comb. nov. for *Philostomella cigarra* (Crustacea: Isopoda: Cymothoidae) with a redescription of the species based on specimens of *Galeocharax kneri*, a freshwater fish of Minas Gerais state, Brazil. *Zoologia* 26(1): 155-160.

Thatcher, V.E., L.P.C. Lopes and O. Froelich. 2003a. *Riggia cryptocularis* sp. n. (Isopoda, Cymothoidae) from the body cavity of a freshwater fish of Mato Grosso do Sul State, Brasil. *Revista Brasileira de Zoologia* 20(2): 285-289.

Thatcher, V.E., J.L. Silva, G.F. Jost and J.M. Souza-Conceição. 2003b. Comparative morphology of *Cymothoa* spp. (Isopoda, Cymothoidae) from Brazilian fishes, with the description of *Cymothoa catarinensis* sp. nov. and redescriptions of *C. excisa* Perty and *C. oestrum* (Linnaeus). *Revista Brasileira de Zoologia* 20(3): 541-552.

Thatcher, V.E., J.M. Souza-Conceição and G.F. Jost. 2003c. *Lironeca desterroensis* sp. n. (Isopoda, Cymothidae) from the gills of a marine fish, *Cetengraulis edentulus* Cuvier, of Santa Catarina Island, Brazil. *Revista Brasileira de Zoologia* 20(2): 251–255.

Timi, J.T., A.L. Lanfranchi and J.L. Luque. 2010. Similarity in parasite communities of the teleost fish *Pinguipes brasilianus* in the southwestern Atlantic: Infracommunities as a tool to detect geographical patterns. *International Journal for Parasitology* 40(2): 243-254.

Velloso, A.L. and J. Pereira Jr. 2010. Influence of ectoparasitism on the welfare of *Micropogonias furnieri*. *Aquaculture* 310(1): 43-46.

Vicentin, W., K.R.I. Vieira, F.E.S. Costa, R.M. Takemoto, L.E.R. Tavares and F. Paiva. 2011. Metazoan endoparasites of *Serrasalmus marginatus* (Characiformes: Serrasalminae) in the Negro River, Pantanal, Brazil. *Revista Brasileira de Parasitologia Veterinária* 20(1): 61-63.

Vital, J.F., A.M.B. Varella, D.B. Porto and J.C.O. Malta. 2011. Sazonalidade da fauna de metazoários de *Pygocentrus nattereri* (Kner, 1858) no lago Piranha (Amazonas, Brasil) e a avaliação de seu potencial como indicadora da saúde do ambiente. *Biota Neotropica* 11(1): 199-204.

Von Martens, E. 1869. Sudbrazilianische süss und Brackwasser-Crustaceen nach den Sammlungen des Dr. Reinh. Hensel. *Archiv für Naturgeschichte* 35(1): 1-37.

Wilson, C.B. 1924. New North American parasitic copepods, new host, and notes on copepod nomenclature. *Proceedings of the United States National Museum* 65(17): 1-22.

Yamada, F.H., R.M. Takemoto and G.C. Pavanelli. 2007. Ecological aspects of ectoparasites from the gills of *Satanoperca pappaterra* (Heckel, 1840) (Cichlidae) from the upper Paraná river floodplain, Brazil. *Acta Scientiarum, Biological Sciences* 29(3): 331-336.

Yamaguti, S. 1963. *Parasitic Copepoda and Branchiura of Fishes*. New York: John Wiley. 1104 p.

Young, P.S. 1998. *Catalogue of Crustacea of Brazil*. Rio de Janeiro: Museu Nacional (Série Livros n. 6). 716 p.

RECEIVED: July 2013
ACCEPTED: September 2013
PUBLISHED ONLINE: November 2013
EDITORIAL RESPONSIBILITY: Luis Ernesto Arruda Bezerra